

P E R S O N A L

COMPUTER

Weekly

NEWS

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on the BBC Micro

SPECTRUM TANKS

Free listing puts you
in the gun turret

MTX MACHINE CODE

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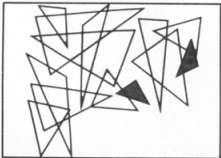
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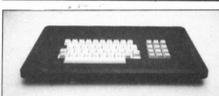
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Lynx future is bleak

By Ralph Bancroft

Computers Ltd, manufacturers of the Lynx range of micros, has finally had to admit defeat in its battle for survival.

The future of the Lynx now looks in doubt.

The company and its sister company GW Design Services Ltd have called a creditors' meeting for this Friday when a statement will be made.

It is expected that the statement will reveal that the combined debts of both companies are over £100,000 and possibly as much as £1,000,000.

Both companies are owned by Computers (Holdings) PLC, a public company with shares that have been traded 'over the counter' although not on the Stock Exchange itself. Computers (Holdings) PLC is not thought to be in debt and will not be included in the

statement to creditors.

Talks are still continuing with a potential bidder for the companies but is unlikely that anything will be finalised before Friday.

This is only the latest in a series of attempts to re-finance Computers stretching back over the last eight months. In the words of Stanley Charles, Computers chairman, all of them 'fell at the last hurdle'.

Mr Charles was not prepared to comment on the extent of the companies' financial difficulties in advance of the creditors' meeting.

He did confirm that 24 members of staff had been made redundant and that fewer than ten staff remain on the payroll. 'We may have to reduce the numbers further,' he added.

The company is continuing to trade on a 'low care and maintenance basis'. 'We hope to ship orders in the near future if the legal

difficulties can be sorted out,' he said.

Legally, a company cannot continue to trade if it is insolvent except in circumstances where it is in the best interests of all parties including the creditors.

The only course of action that is now open to Computers is to recommend to creditors that receivers or liquidators be appointed.

The creditors' meeting promises to be a stormy affair with questions about the failures of the re-financing attempts and the role of the holding company.

One crucial question is who actually owns the name and rights to the Lynx computers and software.

If Computers Ltd owns them it will have an asset that could be sold off to partially repay the creditors. If they are owned by Computers (Holdings) PLC — the parent company — the creditors may find

that Computers Ltd has very few assets.

If Computers Ltd is wound up and a buyer cannot be found for the Lynx it would leave Lynx users unsupported.

Bob Jones, who has recently taken over the running of the Lynx User Group, was not surprised to hear of the company's difficulties. 'They had a damn good computer and not the foggiest idea of how to sell it,' he said.

Computers has been struggling to raise additional money since last October.

In March this year, Mr Charles told PCN (Issue 53) that agreement had been reached with a financial consortium and that the company was 'just waiting for the Stock Exchange paperwork'.

Mr Charles would not comment this week on why that deal failed to materialise.

Acorn adds to Electron

is a new departure for Acorn (though at one time it was mooted as a possibility for the BBC).

Cartridges allow fast error-free loading. For Acornsoft, they provide a secure method of software protection. The catch is the cost.

The first six ROM cartridges to be available are four games: Snapper, Starship Command, Hopper and Countdown to Doom; Tree of Knowledge (an educational program, and the artificial intelligence programming language Lisp. The games and Tree of Knowledge will cost £14.95 and Lisp £39.95.

■ Acorn has also released a modem for the BBC micro.

Prestel Adaptor will be available by mail order only, at £113.85.

As with other BBC peripherals it comes in a cream coloured case matching the BBC micro and with software on ROM.

Compared to other modem-software packages now available it looks underpowered and overpriced.

It will only operate at 1200/75 baud so that it cannot be used with bulletin boards and other 300/300 baud services, and since there is no 1200/1200 half duplex mode it is not viable for user-to-user communications.

On the plus side, the modem has an autodial feature. Telephone numbers can be stored on disk or tape and called up to dial a number automatically.

Included in the ROM Software is the facility to download software from Prestel and similar viewdata services.

Mail Order inquiries should be sent to Vector Marketing, London Road, Denington Estate, Wellingborough, Northamptonshire NN8 2RL.



The Electron expanded: Plus-1 with Acornsoft cartridge software.

Acorn, not renowned for speedy production of peripherals, has produced an add-on for the Electron within a reasonable space of time.

The Plus-1 is an expansion unit that provides a Centronics parallel printer port, an analog joystick port and two slots for Acornsoft's new ROM cartridge software.

It costs £59.90 and will be available from Electron stockists and on mail order from Vector Marketing.

Acorn says the unit can be 'securely fixed' to an Electron and the cartridge slots will be used for future hardware expansions including an RS423 serial interface.

The most notable omission from the Plus-1 is a mode 7 capability to allow the Electron to run software written for the BBC micro. Also missing are a disk interface and the Tube for adding a second processor. It would appear that none of these can be added to the Plus-1 at a future date.

The omissions are significant since Acorn promised at the time of the launch that it would eventually be possible to buy add-ons for the Electron that would turn it into a BBC micro.

The release of cartridge software

ITV on the micro beat

The independent TV network is set on giving you something to watch on the television when you aren't using it as a screen.

This week (Thursday June 7) a new series of Thames Television's Database begins. On Saturday, Gramplan opens up with a series called Bits 'n Pieces. And on Tuesday July 17 the entire network will screen a documentary called The Videogame Game.

The new series of Database has broadened its scope geographically and in the content of its shows. It will go out nationally and will also feature a mailbox so that Prestel users will be able to communicate with the production office, download software, and take a Database newsletter. The Mailbox is on Prestel page 776.

Gramplan's Bits 'n Pieces kicks-off at 10am on Saturday with demos, chat, a problem page and other regular features.

The Videogame Game is a one-off due to be screened at 4.45pm on July 17. In half an hour it will pack in interviews, comment and news.

Dragon moves



time for around £700 for the single drive version and around £850 for the twin drive version.

Another new product was a touch tablet called the Touchmaster. It will start to appear in the shops in September priced at £99 with a free graphics program.

Dragon claims that it uses innovative technology to give a 256 bit resolution and a fast sampling rate of co-ordinate changes.

It will be available in versions for the Dragon, Commodore 64, BBC micro and the Spectrum using Interface 1.

It will be available in versions for the Dragon, Commodore 64, BBC micro and the Spectrum using Interface 1.

Dragon also announced details of two starter packs for the Dragon 32. One packages a Dragon 32, data recorder and Logic 3 Basic tutorial. The other bundles a Dragon 32, data recorder with four games cassettes and a games cartridge.

Dragon Data revealed details of its product strategy at the Consumer Electronics Show at Earls Court last week.

On the GEC stand it was demonstrating a new machine called the Professional aimed at business users.

It consists of a Dragon 64 with integral 3.5in floppy disk drives, each with a 320K capacity, and built-in modem.

The machine runs the OS9 multi-taking operating system and comes complete with RGB, composite video, Centronics parallel and RS232 serial outputs.

It will go on sale in two months

Second coming



The L-shaped micro—Osborne bounces back with a PC-compatible.

Osborne is back from the dead, minus Adam Osborne and plus a fully portable IBM compatible.

The Osborne Encore sports 128K RAM, 80C86 (CMOS 8086) cpu, 16x80 LCD display and single 360K 5.25in floppy as standard, and at nine pounds is eminently portable.

The basic unit is around half the size of a briefcase, and the keyboard folds down from the main unit so that it's vaguely L-shaped in use. There's space for a second disk drive within the main unit, and Centronics, RS232 and 300 baud modem are also standard. Osborne is reticent on pricing at the moment,

but it's likely to sell in this country for somewhere between £1,500 and £2,000.

The UK launch of the machine was graced by a hand-assembled beast that was minus modem and battery pack but, depending on the amount the disks are accessed, its endurance will be around five hours. It's scheduled to hit the stores in August.

The Encore is intended to put Osborne back at the forefront for the portable market, but the company seems to be aiming more at the PC-compatible market rather than at the likes of Apple and Epson. Certainly the price will be competi-

tive with the Compaq (something Osborne seems to set great store by) but it would take a strategy rethink to bring it into line with the Epson PX-8 or the Apple IIc.

It's certainly a lot more portable than the Compaq, but the success of the machine will depend on customers thinking of it as an alternative rather than an adjunct to a desk-top micro. And, as far as flexibility is concerned, Osborne has still had to trade off lap-portability against producing a true desktop equivalent.

As far as Osborne itself is concerned, the company has slimmed down dramatically and now seems to be almost out of the woods. It's no longer in the business of manufacturing, but has retained the structure necessary to sell machines internationally. The enclosure will be sold by Osborne everywhere but in the US, where it will be handled by Morrow Designs.

The company doesn't feel the new machine will cut the feet from under the Osborne I and the Executive, which is curious, considering Osborne sees a desk-top portable as its main competitor. The Osborne I will certainly remain much cheaper, but the Executive, which is currently £1,595 plus VAT for the machine and bundled software, is currently priced around the intended level for the Encore.

PC users get first sight of 'friendlier' dBase III

By Brian Skinner

dBase III is (nearly) here. Ashton Tate has announced an improved version of its successful database language dBase II.

To be released simultaneously in the US and Britain in 'mid-June', dBase III will cost \$695—a British price hasn't yet been fixed. Existing dBase II owners will be able to upgrade for the price difference between the two products.

dBase III offers 'over a billion records' compared with dBase II's limitation of 65,000 or so, but this phenomenal figure will be limited by the constraints of the hardware environment. dBase III also has rather better sorting facilities—binary search and indexed sequential, as well as enhanced reporting facilities, a new manual and revamped packaging. One major improvement is the command facility—designed for the novice to help them through the shock of dBase's complexity, this can be bypassed by the experienced user.

Initially dBase III will be available for the IBM PC and its compatibles (provided they sport 256K RAM), with other versions 'to follow'. The package should be compatible with Framework, Ashton Tate's recently announced integrated software package.

Coleco Adam reaches shops

By Ralph Bancroft

The long-awaited Coleco Adam should start appearing on the shelves of Spectrum dealers within the next week.

Philip Gibbs, marketing director of CBS Electronics told PCN last week that two consignments of Adams were 'on the water' from the US where the system is manufactured (Issue 37).

But he added that it is unlikely that the Adam will be available in large quantities until later in the month.

CBS is currently investigating other outlets for the Adam.

Mr Gibbs was not able to say what the final price of the system will be, though he suggested that £525 might be close.

The Adam, consisting of keyboard, twin tape drives, integral word processing software and a daisywheel printer, created quite a stir when it was announced last year.

However, design and production difficulties delayed its launch in the US giving other companies, such as Sinclair with the QL, time to catch up with competitive products.

The Adam was reviewed in Issue 38.

QL—Sir Clive speaks out



Sir Clive Sinclair has replied to his QL critics in an hour-long exclusive interview with PCN.

From his Knightsbridge office he hit back at criticism he called unfair and unwarranted while accepting blame

for delivery delays.

PCN has been flooded with letters attacking Sir Clive for failure to keep to his promises. Now he has decided to speak out. In a full report next week he

- hits out at his press critics for dealing him unfair treatment,
- explains what went wrong after that mid-January launch,
- speaks candidly about the QL's future.

Back to Basic

By Bryan Skinner

Enterprise is to use the new ANSI standard Basic in its controversial computer.

The new standard is powerful and flexible: it's been likened to Pascal and offers features such as local variables and multiple line functions. But the choice is curious, as most home micros have variants of Microsoft Basic, and those used to this may find the conversion awkward.

The Enterprise will come with a free cassette of programs to help buyers 'convert BBC and Spectrum listings to enterprise Basic'. The 'Basic to Basic' programs won't do a full translation, so it'll be up to the programmer to make adjustments to machine-specific instructions and screen-handling. A spokesman said the programs were designed to 'take some of the hard work out of conversion'.

The cassette will also have demonstration programs and overlays to extend the ANSI Basic. Although their details are still being worked out, one of them will be the

powerful command, 'PRINT USING', which comes as a ROM command on machines such as the Dragon.

The addition of tape-based extensions has led to speculation in some quarters that enterprise faces a 'QL problem': the Basic and operating system are too big for the ROM space originally allowed. But the spokesman denied this, claiming that the overlays gave the machine 'special features', that the method was 'cheaper than using ROMs' and was the 'logical way' to approach the issue.

Enterprise hopes to have the machine ready for the PCW show in September, a year after its debut there.

Future plans include peripherals like Sony 3.5in disk drives and RAM packs in multiples of 64K to allow users to access the theoretical maximum of 3.9Mb.

The company also hopes to have a large amount of software for the machine at its launch—most of this is still being written but the packaging is shown in its impressive new brochure.

VIEW FROM JAPAN



Waiting for a ninth wave to break

By Serge Powell

When you live in a country where technology is the foundation of the national economy and of the international reputation it's easy to develop a jaded, blasé attitude. With micros, for example, each new release can quite easily seem no more exciting than its predecessor, like waves breaking on a beach.

But as any student of Celtic mythology (or any surfer, for that matter) will tell you, every ninth wave is stronger than the rest. Perhaps it isn't recognisable at first; when you're looking for the ninth wave you have to know when to start counting. And there are red herrings — great leaps forward that end up being dumped by a wave that shows promise but finally shrugs off the surf rider engulfs him in several tons of agitated sand.

Sometimes a machine emerges from Japan Inc that is only slightly spectacular and really nothing more than a logical extension of what has gone before — the Honda C250 must have been such a product. Now Epson has launched a portable that I'll lay odds will prove to be in the same category. When the machine is used all over the world and people ask: 'PCjr? What's that?' remember that you read it first in PCN.

Or perhaps the Japanese Computer Exhibition syndrome reduced me to an unusual level of suggestibility. On my way to the business show in Tokyo last week I elected to take the commuter ferry rather than sit in a cab for 40 minutes in a traffic jam. The line for the ferry was one hour long — so you stand in line and you wait and wait and wait. At the exhibition centre countless thousands are trying to get in, so you wait and wait and wait.

Actually I wanted to see only one item — the new Epson series of notebook-sized micros. I say 'series' but I understand that only one of them, what they call here the HC-80 and abroad the PX-8 (Issue 61), is for export.

In Japan all three new units, the HC-40, the HC-80, and the HC-88, come with CP/M in ROM and 64K of RAM, with twin cpm in a master/slave arrangement — a Z80 is the master. They run on batteries.

The 80 and the 88 have an 80 character by eight line screen, the HC-40 has 40 by eight, and in some ways the 40 has the more interesting features. A standard keyboard can be slotted out and replaced by one that is perhaps two-thirds of the width, with an extra 10-key numeric pad. RAM and ROM packages can be plugged in and programmed for the second keyboard to take on such jobs as inventory taking, tour planning for travel agents, and all kinds of weird and wonderful things. It also has overlays in a grid pattern, mimicking the touch-screen grid of the Hewlett-Packard 150.

The main difference between the HC-80 and the HC-88 is that the latter has Japanese word processing capabilities. Both have microcassette storage and other handy peripherals include a battery-operated 3 1/2 in disk with 500K and a 45cps dot-matrix printer, with an 80 column carriage and a six by eight matrix, also battery-powered.

A Supercalc ROM pack is also built-in, which makes it all very impressive, but my real interest was in what it offers to idiots like me who believe that personal computing begins and ends with word processing.

And what do you know, there's a ROM pack version of Wordstar. I presume that some of the more esoteric functions have been dropped, but to compensate for this (depending on your point of view) it contains a little nasty that will prevent the program from being copied.

The Micropro people aren't being too helpful about what is and isn't available in this version, so for as long as I could stand the jostling and shoving I played with the HC-80 and Wordstar.

As for the question of when the 40 will be available in the UK and the US, and when an English language brochure will be available, we'll just have to wait. If suggestibility is the key to selling micros, this could be a winning play.

Metapod may pave the way

By David Janda

Oxford Computer Systems (OCS) has developed a package that could point the way to machine- and processor-independent language compilers.

Demonstrated for the first time at a recent open day, the package is called Metapod. Initially, it will be used internally by OCS to develop language compilers for several machines.

Metapod was developed over a year by technical director Tony Wilkes.

To produce the core of the compiler, a text editor or word processor is first used to enter the 'description' of the language. The definitions are entered using extended Backus-Naur form (BNF) — a grammar used for specifying language syntax. A simple example would be the first line of a description for Basic:

```
[program:] ::= [[statement]];
```

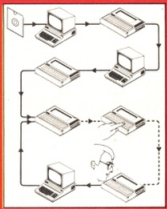
Further definitions would be entered until the syntax is completely specified. Metapod is then run and a choice of minimal Basic or C is specified for the output. In both cases the code is heavily commented.

At this stage, the front end of the compiler — the run-time system — which is developed separately, is merged and the code is cross-compiled and ported to the host machine.

OCS says that it intends Metapod to be a time-saving tool that will produce about 50 per cent of a compiler. It will be used in the near future to produce a C compiler to run on the Macintosh. Further projects will be Basic and possibly Modula 2 for the QL.

Wilkes says that OCS 'intends to be a European Microsoft', and at present OCS is finalising deals to inject large amounts of money into the company.

HUSKY VOICE — The Husky Hunter is claimed by Husky Computers to be covering new ground, literally, as the first handheld portable micro that can be used in the broader context of data capture and report preparation. This is because it's not only portable and tough, but also CP/M compatible. The Hunter can communicate with a host system through RS232 links (as shown right), and its non-volatile memory maintains the status quo when the power is switched off. Husky Computers (0203 668181), incidentally, is the new name of DVW Electronics, which can, with some justice, claim to have invented the portable computer.



Philips to grab Atari stake

The Dutch group Philips is poised to break into home computers with transatlantic deals involving Atari and Thomson.

Atari, a subsidiary of Warner Communications, lost \$418 million last year. Further losses are predicted for 1984.

Warner's chairman, Steven Ross, has reportedly said that major changes will be made at Atari, and Graham Clark, MD of Atari in the UK, confirmed that negotiations were continuing. 'Philips isn't buying Atari, but they are negotiating a financial stake in the company,' he said.

Mr Clark went on to say that Atari has never lost money in Europe, but made heavy losses in the US for a variety of reasons including the plummeting games software prices there.

He was optimistic that Atari was 'on the road to recovery' and said a number of new products were on the way.

Atari's top selling products include the 600XL and 800XL micros, in the £160 to £250 price range. Meanwhile, Philips has until now remained planted firmly in business software with its £3,000 P3500 micro and P2000C Fortran. It does however produce a videogame player, and if the deal concerning Atari goes ahead, Philips will have bagged a space in the home market too.

Closer to home Philips is expected to announce a joint venture next month with the French electronics company Thomson. Thomson launched a home computer, the TO-7, in Paris two weeks ago (issue 63) and Philips is expected to sell this machine under its own name. Rumours in France suggest that the system could become the French equivalent of the BBC micro, by winning the backing of a French TV channel.

● Atari last week laid off about 700 of the 2,000 people at its US head office.

New Commodore duo

Commodore brought two new home micros into the UK through the back door last week, but it looks as though the machines are here to stay.

With unusual coyness, the company that boasts a Royal seal gave its dealers a first look at the Commodore 16 and the Plus/4. The machines are expected to be on show to everybody else at this week's Commodore User Show in west London.

Last year Commodore gave its dealers a first sight of the 700 and 500; the 500 was later dropped and the 700 has been up and down like a yo-yo. But the C16 and Plus/4 could

conform to what John Baxter, Commodore general manager, said in the wake of the Hannover Fair at which several new systems were launched: 'There are a number of options available to us and we will be looking at the most appropriate configurations.'

The C16 has 16K of RAM of which 12K is accessible for Basic programs. It is driven by a 6502-compatible 7501, has a real keyboard, and generates 15 colours with eight luminance levels. Resolution is 320 by 200, and there are two tone generators. Commodore calls it 'a very advanced home computer with features normally

found on computers costing much more'.

The Plus/4, which could have manufacturers ransacking drapers' shops for their future product names, also has a 7501 but 64K of RAM with 60K available to the user. Again it is restricted to 40 columns, and the colour, resolution and sound parameters are the same as on the C16. Both machines will use Basic 3.5 which, with true industry logic, is more advanced than Basic 4 and the Basic 2 familiar to 64 and Vic 20 owners.

The name is supposed to come from its bundled software. The system comes with Three-plus-one

in ROM; this is the commonplace word processing, database management, business graphics and a spreadsheet.

It isn't clear when the systems will be on sale in the UK. Commodore is stoutly denying rumours of an impending price rise on the best-selling 64 with which the new systems will not be compatible. The C16 is expected to cost £129 and the Plus/4 £249.

At that level, the C16 would appear to imply a substantial price cut for the Vic 20 — or its demise, although in the past rumours of its death have been greatly exaggerated.



NOT LEFT OUT — Taking up the cudgels on behalf of the left-handed is TG Game Paddles of Texas and its UK distributor P&P Micro Distributors, has produced a paddle with what it calls a 'reversible' firing button, meaning that right- and left-handed players should get on equally well with them. But TG doesn't say whether the contoured box is as versatile, merely that it will give you 'long hours of play comfort'. The paddles cost £34.40 for a pair and run on Apple IIe and IBM systems. P&P is on 0706 217744.

Modem and matrix printer take place in Atmos line

Oric showed its Atmos modem and Prestel software for the first time last week.

There are no great surprises. The modem is manufactured by OEL, which makes modems for a number of micro companies including Prism and Micronet.

It operates at 1200/75 baud for communicating with Prestel and other worldwide services, as well as 1200/1200 half-duplex for user-to-user communication.

The price, including software, will be around £100 when it is released through Oric dealers in a few weeks.

The software, available on tape and later on disk, allows the

downloading of pages and programs from Prestel as well as providing on-screen commands while on-line to a viewdata service.

The user-to-user communications software is not yet finished, but its use will be limited by the need to switch manually between sending and receiving when in 1200/1200 mode. More advanced modems from OEL and other manufacturers allow the switching to be done under software control.

Oric has also unveiled a new printer. Clad in the same colour scheme as other Atmos products, it performs like an Epson.

It will go on sale for £250 in about three months.

Apple sobers up

By Richard King

The Apple User Show at Slough's Fulcrum Centre last week was the third in succession — it looks as though there could be a tradition developing. To match this sign of maturity the show itself was more sedate than previously.

But then, Apple is assuming the mantle of the industry's only serious challenger to the IBM-PC de facto standard. This is a dignified and worthy post, but it's hoped that the Apple world doesn't lose all its youthful exuberance — it may be its chief advantage against the grey ranks of the IBMables.

The show was much the same size as last year's and featured many of the same exhibitors.

Apart from a large number of ILC systems, a round dozen of which were arrayed on the check-in desk at the top of the escalator, there wasn't a lot of red-hot new stuff in evidence, though many of the older products have evidently matured and undergone considerable changes in the previous 12 months. Robocom's draughting system seemed considerably quicker, for example, and had more libraries available, but wasn't greatly altered otherwise.

Still on the graphics front, Digisolve had some impressive graphics showing on its VGP-64 add-on graphics processors, but at a price which is liable to discourage all but corporate buyers... £900 for the hardware, and another £900 for software to make it useable, not to mention around £650 for a long-persistence monitor. And all that's on top of the Apple, drives, screen, printer, 80-column card and so on.

Dark Star Systems, makers of the Snapshot program-buster, had a novel application on show. It makes use of a large (128K or more) RAMcard to keep several programs in memory at once, so that the active one can be stopped in midstream by the Snapshot and

swapped for another, which can be run quite normally until the job is done, then the original can be re-swapped.

For example, you could be writing a letter and need to look up some names as well as include a small calculated table. No problem... swap out of the editor, look up the names and send them to a temporary file, swap to Viscalc, do the sums, store the results and swap back to the editor... and all without touching a disk. This crude, but nonetheless effective, method of multi-tasking is handled by a small program called the Shuttle, and at only £20 could prove popular. Of course, you have to have a Snapshot and one of the available RAM cards.

Only at one of Pete and Pam's stands did the old Apple atmosphere persist; there was an enjoyable but thoroughly undignified scramble for bargains. But apart from that small ripple the surface of the show was barely ruffled; this may have been due to the weather, which was foul, or to the absence of the usual large contingent of schoolchildren.

Or perhaps Apple has really metamorphosed into a businesslike supplier of business systems, hiding its technology behind a mask of mice and icons and user-friendliness but working on the respectability angle. If so, it appears to be a successful strategy. Staff on several stands reported that visitors were less likely to ask curiosity questions and more inclined to serious dealing.

There are a couple of IBM shows coming up in the next two months — it will be interesting to compare them on scales of enthusiasm, sobriety, credibility, and grey homogeneity. It could be that Apple will have to accept IBM compatibility in all these terms but you can bet that its technology will be more interesting.

PCN CHARTS

GAMES



	GAME TITLE	PUBLISHER	MACHINE	PRICE
▲	1 15 Trashman	New Generation	SP	£5.95
▲	2 — Psysron	Beyond	SP	£7.95
▼	3 1 Jet Set Willy	Soft Projects	SP	£5.95
▲	4 8 Code Name Mat	Micromega	SP	£6.95
▼	5 3 Fighter Pilot	Digital Integ	SP	£7.95
▼	6 2 Space Pilot	Anirog	64	£7.95
▲	7 — Blade Alley	PSS	SP,64	£5.95
▲	8 16 Flight Path 737	Anirog	VIC,64	£7.95
▼	9 4 Atic Atac	Ultimate	SP	£5.50
▼	10 5 Manic Miner	Soft Proj/Bug Byte	SP,64	£5.95
▶	11 11 Blue Thunder	Wilcox	AT,SP	£5.95
▼	12 6 Hunchback	Ocean	64	£6.90
▲	13 23 Forbidden Forest	Cosmi	64	£8.95
▲	14 24 The Boss	Peaksoft	64	£8.95
▼	15 14 Scuba Dive	Durell/Martech	SP,64,OR	£6.95
▲	16 20 Blogger	Aligata	64,BBC	£7.95
▼	17 7 Night Gunner	Digital Integ	SP	£7.95
▲	18 — Solo Flight	Microprose	64,AT	£14.95
▼	19 9 Chequered Flag	Psion	SP	£6.95
▲	20 — Zodiac	Anirog	64	£7.95
▲	21 — Millionaire	Incentive	SP	£5.50
▼	22 17 Rev Of MCs	Llamosoft	64	£5.95
▼	23 10 Fred	Quicksilva	SP	£5.90
▲	24 — International Football	Commodore	64	£8.95
▲	25 — Aztec Challenge	Cosmi	64,AT	£8.95
▼	26 12 Ant Attack	Quicksilva	SP	£6.95
▲	27 — Football Manager	Addictive	SP	£6.95
▲	28 — Sheep In Space	Llamosoft	64	£5.95
▲	29 — Fortress	Amcom	BBC	£8.95
▼	30 18 Pilot 64	Abbex	64	£7.50

MICROS

Top Ten over £1,000

TW	LW	MANUFACTURER	PRICE	DISTRIBUTOR
▲	1	Apple III	£2,280	AP
▼	2	IBM PC/XT	£2,390	IBM
▼	3	ACT Sirius	£2,525	ACT
▼	4	ACT Apricot	£1,760	ACT
▶	5	Wang Professional	£3,076	WANG
▲	6	Kaypro	£2,595	CKC
▲	7	Olivetti M20	£2,180	OL
▲	8	Televideo TS1603	£2,640	TH
▼	9	DEC Rainbow 100	£2,359	DEC
▼	10	NCR Decision Mate V	£1,984	NCR

Top Ten up to £1,000

TW	LW	MANUFACTURER	PRICE	DISTRIBUTOR
▶	1	CBM 64	£199	CBM
▶	2	Spectrum	£99	SI
▶	3	BBC B	£399	AC
▲	4	Electron	£199	AC
▼	5	Vic 20	£140	CBM
▲	6	MTX 500	£275	MTX
▲	7	Oric Atmos	£175	OR
▼	8	Dragon 32	£175	DD
▶	9	ZX81	£40	SI
▶	10	Atari 600XL	£150	AT

These charts are compiled from both independent and multiple sources across the nation. They reflect what's happening in high streets during the fortnight up to **May 25**. The games chart is updated every other week.

Neither mail order nor deposit-only orders are included in these listings. The prices quoted are for the no-frills models and include VAT.

Information for the top-selling micros is culled from retailers and dealers throughout the country and is updated every month.

PCN Charts are compiled exclusively for us by RAM/C, who can be contacted on 01-892 6596.

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With this program your cashflow will do just that.

Flow.

Practicalc 64 accepts both numerical and alphabetical entries and allows you to work out sales forecasts, long-term budgets, sales models or long term cash plans.

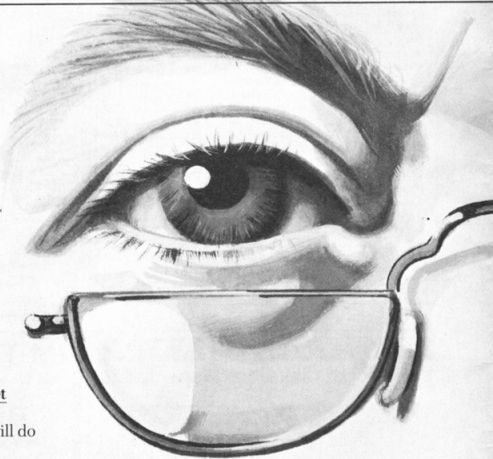
All in a fraction of the time they normally take.

Practicalc 64 has 2000 cells, more than 20 mathematical functions, (including logarithms and roots), can insert or delete rows or columns, can 'SORT' information alpha-numerically and has a 'SEEK' function to search for specific information.

It can even display the information in graph form to allow a quick visual appraisal of the situation. Disc £44.50 (tape £39.95).

Over 20 mathematical functions.
Column width up to 38 characters
2000 cells.
Graph function.

DATE	AMOUNT	TOTAL	AVERAGE
1987-01-01	1000.00	1000.00	1000.00
1987-01-15	500.00	1500.00	1000.00
1987-02-01	200.00	1700.00	1000.00
1987-02-15	300.00	2000.00	1000.00
1987-03-01	100.00	2100.00	1000.00
1987-03-15	50.00	2150.00	1000.00
1987-04-01	0.00	2150.00	1000.00
1987-04-15	0.00	2150.00	1000.00
1987-05-01	0.00	2150.00	1000.00
1987-05-15	0.00	2150.00	1000.00
1987-06-01	0.00	2150.00	1000.00
1987-06-15	0.00	2150.00	1000.00
1987-07-01	0.00	2150.00	1000.00
1987-07-15	0.00	2150.00	1000.00
1987-08-01	0.00	2150.00	1000.00
1987-08-15	0.00	2150.00	1000.00
1987-09-01	0.00	2150.00	1000.00
1987-09-15	0.00	2150.00	1000.00
1987-10-01	0.00	2150.00	1000.00
1987-10-15	0.00	2150.00	1000.00
1987-11-01	0.00	2150.00	1000.00
1987-11-15	0.00	2150.00	1000.00
1987-12-01	0.00	2150.00	1000.00
1987-12-15	0.00	2150.00	1000.00
1987-12-31	0.00	2150.00	1000.00
TOTAL	2150.00	2150.00	1000.00
AVERAGE	1000.00	1000.00	1000.00



Practifile 64. The database for Commodore 64.

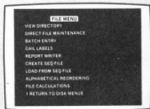
Practifile means an end to bulky and time-consuming storage of files, client or patient information or names and addresses.

And it means you'll no longer have to spend minutes or hours searching through piles of paper for a specific piece of information.

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location, stock, year-to-date sales, re-order date, minimum quantity, vendor, list price and other important facts.

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problems.



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PCN 6/85

 PRACTICORP

Was reviewer on rocky ground?

Thank you for the kind review of Peter Shaw's and my book, (Issue 62), but I would like to correct you on a number of points. For instance, the book contains enough information for the beginner to create a complete adventure game, and all the sections are covered in sufficient detail.

Second, I do not know who 'PCN's cultural correspondent' is but I would like to point out that the Scylla is not a rock, but (and I quote from 'All About Monsters'), 'A six-headed serpent which, in Greek mythology, lived in a cave on the coast of Sicily and which snatched and devoured passing sailors'.

I believe that this would quite validly count as a monster; perhaps the reviewer is the one with a 'need for good research'.

J Mortleman,
London E18.

But we said there was enough information to allow you to create adventures of your own. As regards Scylla, dictionaries variously describe it/er as a six-headed monster, a sea nymph, a sea monster and the daughter of the king of Megara. PCN's geography correspondent (the culture correspondent has been taken suddenly ill) describes it as an extrant rock off the straits of Messina, and it seems that the rock, though correct, is a later innovation (Chambers 20th Century—see Charbydis).

Jolly Roger's hearty disrespect

I am writing to complain about the appalling standard of letters in your publication. They seem to indicate a total disregard for the aspirations and opinions of the average pirate in the street.

Two points which the crew of this vessel and I find particularly disturbing seem to appear in your letters pages more often than in yours for a magazine which purports to represent the 'free' computer press. I think you should clear the air once and for all.

My point is this: the sick and the elderly in our society can no longer be expected to fork out £14.95 for Aviator or the even more outrageous £30 for Lotus 1-2-3. These people depend on financial planning aids of this nature to make ends meet. It is with deep regret that we,

Air your opinions, share your experiences or just point out our occasional blunders. If you have an impressive way with words you may gain £10 for the star letter.

WRITE TO: Random Access, Personal Computer News, VNU, Evelyn House, 62 Oxford Street, London W1A 2HG.



Would you like to see your name in print?
Here is your chance on PCN's letters page.

The Guild of Software Pirates, are forced out of the market place by irresponsible 'protection'. We seem to have heard that term before (but then it was referring to the Mafia...)

This, allied with illegal copying of our work has driven many a dishonest businessman to the seedy, notorious world of tax-evil—it can no longer be tolerated.

The second point on which I want some form of explanation is that have the letters pages of the nation's computer magazines been taken over by loony right wing particle physicist smart ass bores, trying to do bold Sir Clive out of an honest crust with their mismy, pernickety criticism of the name Quantum Lurch?

Ever since it appeared in 'New Scientist', letters pages have been inundated with scyphantic, 'me-too' letters, informing the great unwashed of the precise scientific meaning of the word 'Quantum'. Where is your imagination? Surely one of you perspicacious plagiarists could copy something less predictable. Where are all the facetious remarks about 'the Charge on the Electron'?

As the great man once said '... Many take to Science out of a joyful sense of superior intellectual power...'. Come on then fellas—show us what you're made of.

If anyone at Virgin software reads this then they should know that charging £7.95 for 'owzat' is nothing short of criminal...
Jolly Roger and his chums...
HMS Dodgy Bodger.

Woeful tale of a micro enthusiast

For Christmas 1982 I got my first computer. It was a ZX81. I was over the moon with it because my friends had them too and I borrowed some of their software.

But four weeks after Christmas it packed up and we took it back to the

shop, W H Smith, which was very helpful. We left it there being told it would take a week.

Two weeks later we phoned and were told it would be ready the next Tuesday. We collected the supposedly mended ZX81 and took it home. It still didn't work.

We returned it and waited two more weeks and then we were given a new one. This did not work either. So we returned it once more.

The shop tested it and gave us yet another new ZX81. This was fine for about four weeks and then it wouldn't load and went kaput. We took it back and got another new one. This also went wrong. So we decided to get a ZX Spectrum.

This worked fine. Then my tape recorder broke and we took both back to W H Smith, which was again very helpful and sent it away, saying it would take two weeks.

I was very upset with all the bad luck I had been having. Anyway, two weeks later we returned to W H Smith to collect it, but were told it had been lost and would take at least two weeks to replace.

Finally, four weeks later I got it back and then my Spectrum went wrong so once again we returned it to W H Smith who kept it for nine weeks and then I got it back, working fine.

Things were looking bad when some of my software did not work. So back to W H Smith, which gave

me a new type. Just before Christmas 1983 I decided to get a bigger computer and I set my sights on the new Sharp MZ 700, but first I had to sell my Spectrum. I sold it in a matter of weeks, got my Sharp, which cost £290 with the built-in tape recorder. Six weeks after Christmas its price dropped to £229 with extra software and built-in tape recorder.

Between these times I've managed to fracture my arm, crack two ribs and broke my thumb.

I think I'm unlucky.
C Edwards,
Brackley, Northants

Could be, Mr Edwards, could be...
Ed.

Blueprint for the ideal console

The confusing variety of keyboard controls used by different games to which M Jeanes refers (Issue 59) can be easily overcome. *Fortress* for the BBC allows you to change the controls to suit yourself.

While joysticks do overcome many problems, it can be very expensive replacing what must surely rate as second only to cellophane wrappers in the built-in obsolescence stakes.

Hopefully, someone will manufacture a sturdy arcade style console which may balance in the lap or fix to a worktop and can be configured

PCN £10 Star Letter



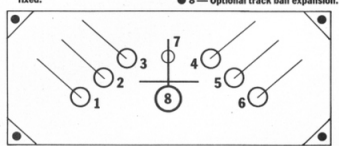
for a wide variety of games — I enclose a brief outline.

The Deluxe Console (£30 max)

- six locatable fire buttons
- real knob-style joystick
- expandable — add-on fire/control joystick, track ball or soon-to-be-released steering wheel
- interfaces for all computers £9.99 — fully programmable.
- supplied with plastic G clamps for table taps. But may be screwed onto computer desk.

Gerry King,
Addington, Croydon.

- 1-6 Fire/control buttons may be located in these positions, moved up and down channels and then fixed.



- 7 — Joystick may be located anywhere in the inverted 'T' channel
- 8 — Optional track ball expansion.

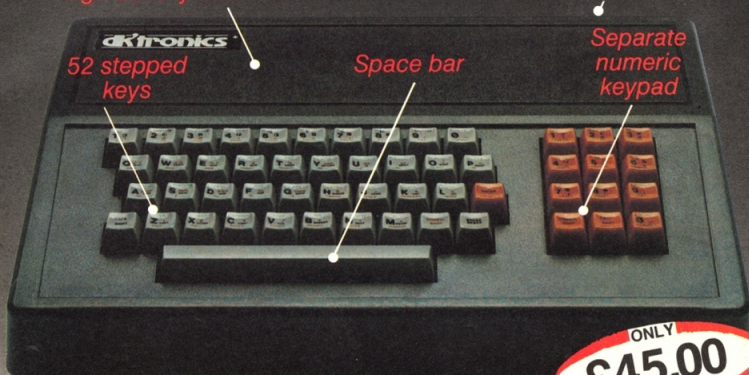
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Caught up with 3D graphics

Q I have been working for some months on a three dimensional maze/adventure game for the 48K Spectrum. It's nearing completion, but I'm faced with one or two problems.

The game involves treasures and monsters — the former have been made into graphics, but the latter have not. The reason for this is memory. I only have about 11K of spare RAM remaining, and I want to keep a 2K buffer for inputs and such-like, another 3K for 'other hazards' and 2K for bits and bobs, leaving around 4K for graphics.

I've assigned seven monsters in an array, and don't think I would have enough memory to draw them all. The maze itself only uses the PLOT and DRAW commands, and doesn't use the paint routine I've written for the treasures as that would take ages. I do, however, hope to convert most of the program to machine code.

Which is more interesting — seven graphics monsters, which would mean cutbacks on various other hazards, or seven or eight more monsters, but with no graphics? Could you also recommend a good book on speeding up graphics and mixing colours, and how do I go about copyrighting the game when I've finished it?

Finally, I would like a good title page for the game. Which of the popular graphics packages do you think would be best for my needs?

*Russel Ould,
Selly Oak, Birmingham*

A Your main problem would seem to be one of marketing strategies rather than memory. Adventure games basically come in two forms — the high-resolution graphic game, and the complicated text adventure. The former category, if they're slick enough, can sell quite well, while the latter sell at a much lower level, but possibly for much longer.

The reason for this is shortage of memory. If you look at a

game like the *Hobbit* you'll see that it's still complex, but this is because the graphics are limited to screens. At the other extreme you have the Oracle's Cave, which has superb moving, scrolling graphics, but very little adventure left in it.

Your problem would seem to be deciding which variant you're going to go for, and the amount of money you want to make is obviously a factor to be taken into consideration.

If you were to go for a *Hobbit*-style game you could possibly solve your problems in one fell swoop. Print 'n' Plotter's Paintbox seems slightly more versatile than Melbourne Draw, although both are good packages, and could be used to people your adventure with a series of SCREENS.

Any more complex solution will depend on your getting to grips with machine code. Toni Baker's book on the subject (*Interface Publications*) is a good start, and you should also get the Complete Spectrum ROM Disassembly from Melbourne House.

As for copyright, this is yours already. Your main problem would be if an unscrupulous software house received your program then marketed a version, denying that yours have been plagiarised. To guard against this it might well be worth lodging a copy of the program with your bank manager or solicitor, to be used as evidence if the worst came to the worst, but you automatically hold copyright of any program you produce unless you sign it away to some one else.

Not so random numbering

Q Random numbers are causing problems on my Memotech. If I run the following program I always get the same sequence of numbers:

```
10 RAND 1000
20 FOR I=1 TO 10
30 PRINT INT(RND*50)
40 NEXT I
```

Could you tell me if there is any way round this problem?

*Methew Jones,
Amersham, Bucks*

A The MTX Random Number Generator works on a pseudo-random number sequence, which means that your program will produce a series of

random numbers. But when you run it again, it will produce the same sequence. If you substitute RAND 500 you will see a completely different set of random numbers displayed. However, random 500 will produce the same sequence each time it is run.

To overcome this, and to produce truly random numbers insert the minus sign like this: RAND -1000. The program below will satisfy your needs.

```
10 RAND -1000
20 FOR I = 1 TO 10
30 LET X = INT(RND*50 + 1)
40 PRINT X;
50 NEXT I
```

Here's happy landings

Q I have two questions: 1. Is the mechanical joystick worth buying?

2. Why does the following part of my program not work? It is in chapter 14 of the Spectrum handbook:

```
FOR N=0 TO 6: READ P$: FOR F=1 TO 7: READ A: POKE USR P$+F,A: NEXT F: NEXT N
```

It comes up with error 2: Variable not found in respect of READ A. I tried changing the variable to X but it still came up with the same error.

Incidentally, regarding the joystick, I must admit that in my day we had no brakes, flaps or retractable undercarriage, but at least we could cope with the odd forced landing. However, I find the Spectrum keys are a little too insensitive to give smooth control on Flight Simulation.

*W H Riley,
Pwllheli, Gwynedd.*

A You'll find it a lot easier to correct bugs in your programs if you acquire a thorough understanding of what they're doing. The program in question is the one in the Spectrum manual which uses user defined graphics to produce chess pieces, and if you cut out all the rigmorle basically what it does is this:

```
10 FOR A=0 TO 47
20 READ X
30 POKE USR "A"+A,X
40 NEXT A
50 DATA . . .
```

Lop out the parts of the DATA statements in the original programs that are in quotes ("b", "k", "r" etc) and type in the binary numbers, remembering to put commas in

between them. You'll now have a program that does the same as the one in the manual, but uses the letters A-F instead of those previously specified.

Now ask yourself what the program's doing. Line 10 is setting up a FOR . . . NEXT loop of 0-47 (ie 48) steps, so the X in line 20 will be read 48 times, and if you have 48 items of data in line 50 this part of the program will work. This is important, because when you're dealing with DATA statements the major reason for programs not working is having the wrong number of data statements.

In line 30 you're POKEing the data X into a memory location. USR "A" is a specific memory location, the location occupied by one of the eight rows of numbers that make up the Spectrum's graphic character A. The other rows of this character are next to this in memory, so what is the FOR . . . NEXT loop doing?

First, as a=0, it's POKEing a number into USR "A"+0. The next time a=1, so it POKES the next number into USR "A"+1, ie the adjacent memory location, and so on. You don't have to specify the letters you wish to redefine, because the graphics characters are stored in alphabetical order, so when it has filled A it goes on to B.

The Sinclair program you started with is storing a piece of string data before the numbers you POKE in to make up the redefined characters. So there's an extra FOR . . . NEXT loop to take you through the letters you wish to redefine, which are p,r,n,b,k and q. The string data is stored with the numeric data for the particular character being redefined at that point so, for example, the data for the bishop specifies "b" to be redefined, then the eight numbers following "b" actually do the redefining.

The manual does it this way to make it easier for the beginner to understand, but programmers tend to forget that what looks elegant to a programmer isn't always obvious to a beginner.

If flight simulators are your bag, the mechanical joystick is probably a good buy. If you want to play games that use a variety of different control keys, get yourself a proper joystick, either a Kempston, or a programmable one.

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MICROWAVES

More hints and tips from our readers to make programming a little easier.

You all know the feeling: after hours, days or even weeks spent on a particular problem you suddenly see the answer. Or on one of those late-night expeditions through the memory map you find some undiscovered feature. Well don't keep it to yourself—send it here. We pay £5 for every tip and routine printed and £25 for the Microwave of the Month.

Send your contributions to: *Microwaves, PCN, 62 Oxford Street, London W1A 2HG.*

Security and protection

Most people are interested in protecting their programs on their home micros. A useful *FX command for the BBC micro is *FX200,3 which carries out two tasks: it totally disables the

escape key; and on pressing the BREAK key or CONTROL BREAK, it scrambles the memory so that when OLD is typed in order to retrieve the program, Bad Program will appear on the screen.

Another hint for BBC users is the Break routine. This is done with the command CALL#0903. It can be used directly from Basic programs and could be useful for 'another game' option.

*Graeme Tweddell
West Rainton,
Co Durham*

Bordering on the colourful

Here's how to create BORDER colour commands using the OUT function on a Spectrum. Use OUT 23658,n where n is one of the Spectrum's colour codes between 0 and 7.

*Tony Stevens
Dymchurch, Kent*

Making a point for that Lynx

```
CD 97 34 7D E6 07 C1 06 01 CB 00 3D 23 F0 0E
00 C5 CB 3C CB 1D CB 6C 00 1D CB 3C CB 1D E5
ED 5B 9E 62 19 CD 69 00 7D E1 C1 A0 20 01 0E
C5 E5 ED 5B 90 62 19 CD 69 00 7D E1 C1 A0 20
02 0C 0C C5 E5 ED 5B 92 62 19 CD 70 00 7D E1
C1 A0 20 04 0C 0C 0C 26 00 69 C3 C4 C4 .
```

The Lynx does not have a point function included in its Basic language but here is a routine to rectify this situation. Once typed in it can be accessed from Basic by using one of the user functions in this form:

C=USER0(X+Y*256) where x and y are the x and y coordinates of the point. In this case c will be the colour at that point.

The routine is re-locatable and can be placed near the top of the memory in the following way:

```
>RESERVE #9F50
>MON
* M 9F50
```

Then type in the hexadecimal numbers shown above, pressing Return at the end of each line.

Return to Basic by typing J, then enter DPOKE #627D, #9F50 and the point function will be ready.

*Mark Glossop
Sheffield, South Yorkshire.*

Creating a message window

This machine code routine for the Oric-1 creates a window near the bottom of the screen and scrolls this window one space to the left each time it is called. It could display ticker-tape messages during games.

J Morris, Gateshead, Tyne & Wear

```
10 MC=#400
20 FORL=#0 TO 43
30 READ B : POKE MC + L, B
40 NEXT
50 DATA #A2, #03, #A9, #A0, #05, #A0, #A9, #BE, #05, #A1
60 DATA #A0, #00, #01, #40, #40, #CB, #01, #A0, #00, #91
70 DATA #A0, #CB, #CB, #20, #DD, #F5, #6B, #91, #A0, #10
80 DATA #A0, #2B, #65, #40, #0B, #A0, #00, #02, #F6, #A1
90 DATA #CA, #DD, #0F, #60
100 CLS: PLOT 9, 21, "PERSONAL COMPUTER NEWS"
110 CALL (MC): WAIT 10: GOTO 110
```

Routine aids complete recovery

Here is a machine code routine for the Oric-1 which enables the complete recovery of a Basic program after the command has been issued. Note that recovery is not possible if a new program line has been entered or an error occurs.

J Dunster Southsea, Portsmouth.

10 REM OLD command JPD 1984

20 FOR A = #400 TO #447

30 : READ B

40 : POKE A, B

50 NEXT A

60 DOKE #2F5, #400 ' Reset ! to OLD

70 END

80 DATA #A0, #00, #B9, #05, #05, #F0, #04

81 DATA #C8, #4C, #02, #04, #C8, #98, #18

82 DATA #69, #05, #8D, #01, #05, #A9, #05

83 DATA #8D, #02, #05, #A9, #01, #85, #00

84 DATA #A9, #05, #85, #01, #A0, #00, #B1

85 DATA #00, #D0, #13, #C8, #B1, #00, #D0

86 DATA #0E, #A5, #00, #18, #69, #02, #85

87 DATA #9C, #A5, #01, #69, #00, #85, #9D

88 DATA #60, #A0, #00, #B1, #00, #AA, #CB

89 DATA #B1, #00, #86, #00, #85, #01, #4C

90 DATA #20, #04

Function key in the Oric Atmos

Many people have the idea that the function key on the Oric Atmos is unconnected as it appears to be unusable from the system. In fact the number 165 is stored in location 521 when the function key is pressed. This is the same memory location used for the control and the right and left shift keys. Therefore it could be used in a similar way to increase the keyboard. This short program will demonstrate the function key:

```
10 REPEAT
20 AS=KEY$
30 UNTIL PEEK(521)=165
40 PRINT "YOU PRESSED THE FUNCTION KEY"
```

*John T Chatwin
Bednall, Stafford.*

Dragon at the rainbow

Here is a short program demonstrating every possible combination of colour mixing on the Dragon 32 using memory location 178 which controls the foreground colour. If location 179 is used the background colours can be seen.

```
10 PMODE 3,1: PCLS3: SCREEN1,0
20 FOR C=0 TO 255
30 POKE 178,C
40 LINE(78,46)-(178,146),PSET,BF
50 IF INKEY$<">" THEN 80
```

```
60 NEXT C
70 GOTO 70
80 CLS: PRINT C
```

Pressing a key will stop the program and give you the current number used in location 178 or 179. Use 179 instead of 178 in line 30 to give you the background colours.

*Mark Wood
Byfleet, Surrey*

Total control of BBC errors

On the BBC computer the printing of an error message may be suppressed and the error handled separately by the user by using a program line of the form: ON ERROR PROC ERROR.

This is explained in the user guide with a list of error numbers and messages. However this list is not complete. The following errors are also handled by the 1.2 operating system:

Error number	Message
213	Locked
214	File not found
215	Bad ROM
247	OS 1.20
249	Language?
250	Key in use
251	Bad key
252	Bad address
253	Bad string
254	Bad command

*David Abbott
Horsham, Sussex.*

Janice McKenzie uncovers a Basic pressure group in south east London.

Demo mode

Members of South-East London Microcomputer Club are something of a pressure group these days—they want all Basic software to be written in Micro-soft Basic.

The members feel this would cut out battling with various different versions of the language and would create one accepted version, suitable for all machines.

Member Philip Duda recently demonstrated a Softlife Epron Programmer, specifically designed for use with the BBC B. Used to program the two kinds of Epron most commonly used on the BBC—the 2764 and 27128 — features include a zero insertion force socket and a built-in 21-volt programming power supply.

Recent events have included a Micronet demo from Vernon Quaintance of the ALCC, a talk on software from local company Soft Machine and a

Commodore peripherals demonstration.

Thames Polytechnic's computer suite proves useful from time to time but access is limited because of security. The poly has an Econet system with about 20 BBCs, as well as printers, disk drives and colour monitors, while three of the club's 15 members bring their own machines.

Having just reformed after a shutdown, the club charges a £5 subscription and is looking for people willing to give more demonstrations, which take up half its meeting time.

Name South East London Microcomputer Club **Venue** Thames Polytechnic, 12-18 Wellington Street, Woolwich, London SE18 **Meetings** First and third Wednesday of each month **Contact** Peter Phillips Tel: 01-853 5829



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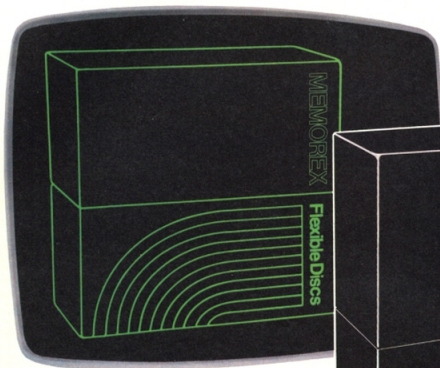
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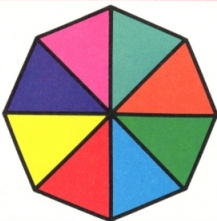
MEMOREX

Tim Brightwell provides an insight into the BBC micro's graphics facilities with several useful routines.

Colour in the Beeb

ROSSETTE

```
10 MODE 2
20 VDU 29,640;512;
30 DG=0:RD=500
40 PLOT 4,0,RD
50 FOR I = 1 TO 7
60 GCOL 0,I
70 DG=DG+56
80 A=SIN(RAD(DG))*RD
90 B=COS(RAD(DG))*RD
100 PLOT 4,0,0
110 PLOT 85,A,B
120 RD=RD-2
130 NEXT I
140 GOTO 50
```



The versatility of the BBC micro is practically unbeatable. If you include teletext, then the Beeb provides six distinct graphic modes, each employing variations of screen resolutions, colours and memory usage.

Mode 0, for example, gives 640×256 locations, or 163,840 pixels. Each of these can be addressed separately. The Contour programme here shows the kind of refined image that is possible. BBC Basic also has good trigonometry functions, such as Sin, Cos, Rad and DEG, allowing cones or globes to be created with a simple algorithm.

In all graphic modes the computer considers the screen to be gridded by 1280 units across, and 1040 units up. Position 0,0 is the left hand corner and 1279, 1023 the top right. The reason for this when the top resolution is only 640 by 256 is because the computer works from the nearest pixel to the point specified.

The graphics cursor resides at position 0,0. Think of the cursor as the pen, and the screen as an easel — to draw a line from the top right of one screen to the middle, you need to 'lift' the pen to the centre — MOVE 640,512 followed by marking the line — DRAW 1279,1023.

The Random Triangles program shows how to move and draw to random points anywhere on the screen. Adding PLOT 85,1279,0 fills in a triangle. GCOL 0,1 sets the 'chalk' colour to red. The table in the keyword section gives the values for other colours.

Both the Random Triangle and Rosette programs use these commands to dramatic effect.

Graphic animation from Basic can be a problem. Any reasonably complex effect, such as 3D rotation, requires an enormous amount of calculation before each new plot, so it can take hours to run what should be a five-second sequence. One such sequence, the imploding 4 on Channel Four, was recorded over several hours and condensed into the short, dynamic image

you see on TV.

But there are ways to cheat and create passable images. One method is to work out each position on a piece of graph paper and type the values into data statements. Then read the contents of a file, thus bypassing calculation, and speeding up the image. An example of animation is shown in the Runners program.

With the command VDU 23 up to 32 individual characters can be defined. Just think of the character shape as covered by an 8×8 grid. A way to achieve remarkable pictures is to lay a piece of tracing paper over a map, and mark it into gridded sections. Using undefined characters, I

have achieved accurate images of continents. Taking this one step further, with the help of a two-dimensional array showing states in the US, the cursor can rest on any part of the map and you can call up the state's name on the screen. This application has considerable learning possibilities.

Teletext

Teletext mode uses control characters plus a character set to form a coarse but memory saving screen. None of the usual commands, PLOT, DRAW or MOVE is used. A picture is built up by printing characters in a similar way to the Runners program.

RANDOM TRIANGLES

```
10 MODE 2
20 FOR I = 1 TO 250
30 GCOL 0,RND(16)
40 PLOT 85,RND(1279),RND(1023)
50 NEXT I
60 MODE 6:END
```



Each character position is divided into six pixels in a two-horizontal by three-vertical arrangement. The code for each character is given by adding the numbers of the cells to be the foreground colour to 160.

Each line starts with a VDU control character to define the required colour.

VDU drivers generate the ASCII characters and encompass an upper and lower case text. For example, `PRINT CHR$ 65; CHR$ 97` will print Aa. Equally the statement `VDU 65,97` will have the same effect. This is relevant to 65,97 graphics since text in ASCII begins at 32 and beneath (0-31) are control codes that can create the most versatile easel imaginable.

You can create text windows on a graphics screen and vice versa, access 16 colours, draw and plot using a written statement to indicate where on the screen, change the mode, clear the screen (or part of it) and best of all, invent up to 32 characters, from a space invader to a sophisticated map of the world. The Runners program is an example of character definition.

Basic keywords

It is vital to understand how the Basic keywords work. `MOVE` has two parameters (x,y) and moves the graphic cursor to the point specified without drawing a line *ie* `MOVE 300,300`. `DRAW` works in a similar way but marks a line on the route. *ie* `DRAW600,600`.

`PLOT` has three parameters. The first selects the nature of the plot such as solid triangles or dotted lines and the last two are the point on the screen to be plotted to *ie* `PLOT 85,100,90`.

`GCOL` has two parameters: the second refers to a colour, and the first to the way that colour interacts with a colour already there. `GCOL 0,4` will draw a blue line. `GCOL 1,4` will OR the blue colour with the colour already there. `GCOL 2,4` will AND, and `GCOL 3,4` will EXCLUSIVE OR. Try combining colours using different first parameters. `CLG` clears the graphics area of the screen and `CLS` clears the text area.

`TAB` allows you to put the text cursor anywhere on the screen and has two parameters, first the column and then the line. For example, `TAB (4,8)` puts the cursor on the fourth column in the eighth line.

`COLOUR` is the text equivalent of `GCOL` but with only one parameter. `COLOUR 2` sets the foreground (text) to green; `COLOUR 129` changes the background to red. (See colour tables).

`POINT` is a clever command that returns the colour (numbers) of any given screen location. In a game in which planes are shot from the sky, and the survival of the occupants depends upon crashing into the ocean, `POINT` can test the crash location for the colour blue, *ie* `IF POINT (X,Y) = 4 THEN PROCPLASH`.

*FX calls are part of the operating system but can be used as extensively as the VDU drivers to alter the rate at which two colours flash etc.

CONTOUR

```

10 MODE 0
20 DIM HL%(127)
30 FOR HI%=1 TO 32
40 I%=HI%*32
50 MOVE 0,I%
60 HJ=-I%
70 K=0
80 FOR J%=1 TO 127
90 K=K+(SIN(RAD (HJ/4)))*1.25)
100 L%=I%+(SIN(RAD (J%*10+HJ))*K)
110 IF L%<=HL%(J%) MOVE J%*10,L%:GOTO 140
120 HL%(J%)=L%
130 DRAW J%*10,L%
140 NEXT J%
150 NEXT HI%
160 END
    
```

RUNNERS

```

5 MODE 1
10 VDU 23;8202;0;0;0;
20 VDU 23,224,12,12,12,28,62,95,93,44
30 VDU 23,225,0,0,0,0,96,192,128,0
40 VDU 23,226,44,15,15,24,248,240,128,0
50 VDU 23,227,0,192,224,56,16,0,0,0
60 VDU 23,228,12,12,12,28,28,28,28,12
70 VDU 23,229,12,14,6,6,6,6,6,7
80 FOR L= 1 TO 30 STEP 2
90 CLS
100 FOR I=-3 TO 25 STEP 2
110 FOR P=1 TO 3
120 PRINT TAB(P*4+I,L);
130 VDU 17,P
140 VDU 32,224,225,10,8,8,8,32,226,227
150 NEXT P
160 GOSUB 270
170 FOR P= 1 TO 3
180 PRINT TAB(P*4+I+1,L);
190 VDU 17,P
200 VDU 32,228,10,8,8,32,229
210 NEXT P
220 GOSUB 270
230 NEXT I
240 NEXT L
250 MODE 6
260 END
270 FOR G= 1 TO 100
280 NEXT G
290 RETURN
    
```

COLOUR CHART (FOR MODE 2)

FOREGROUND	BACKGROUND	COLOUR
0	128	black
1	129	red
2	130	green
3	131	yellow
4	132	blue
5	133	magenta
6	134	cyan
7	135	white
8	136	fishing black/white
9	137	fishing red/cyan
10	138	fishing green/magenta
11	139	fishing yellow/blue
12	140	fishing blue/white
13	141	fishing magenta/green
14	142	fishing cyan/red
15	143	fishing white/black

More useful ROM routines for Spectrum owners from Steve Kramer.

All roads lead to ROM

The RST 56 (38H) instruction is used by the Spectrum to scan the keyboard and update the FRAMES system variables and is called by the maskable interrupt routine. If all that is required is to see if a key has been pressed BIT 5 of 23611 can be tested. If it is set, a key has been pressed since it was last reset.

Note that it needs to be reset. The code of the last key pressed can be found from 23560. This is often sufficient for getting input from the keyboard but has disadvantages. Firstly it is updated only 50 times a second (60 if the mains frequency is 60HZ for you Americans). So you cannot do a RES 5 instruction immediately followed by a look at the bit, as even if a key is being pressed the keyboard almost certainly will not have been scanned by an interrupt. Otherwise, if the interrupts are off the keyboard will never be scanned unless you do so, so try:

```
LD HL,23611
RES 5,(HL)
LD A,FF
LD (23552),A
RST 56
XOR A
BIT 5,(HL)
JP Z,NO KEY
LD A,(23560)
```

NO KEY (whatever)

This returns in the A register the code of the key being pressed at the label NO KEY, or 0 if no key is being pressed.

In the above routine the LD HL,23611 instruction could have been omitted and (IY+1) tested instead as the IY register

contains the address of the system variable ERR NR (23610) and is used for addressing the system variables by the ROM. This is why, if you use the IY register in your programs, you must make sure the interrupts are off or directed to your own routines. You must also reset the IY register to the correct address before using the ROM or reverting to the normal interrupt mode.

The second problem is that you cannot test for more than one key being pressed at a time.

To overcome this you will need to write your own keyboard scanning routine. If you want only to find if a key is being pressed without worrying about which key or how many keys you could do something like this:

```
XOR A;make sure that A contains 0
IN A,(FEH);FEH is the input port from
the keyboard etc.
LD D,31
AND D;Get rid of the etc. in the 3 high bits
XOR D;Flip the remaining bits
JR Z,NO KEY.
```

The keyboard can be scanned properly to discover which keys are being pressed by loading the A register with the value of the line to be scanned prior to the IN A,(FEH) instruction.

The Spectrum's keyboard is laid out as follows. The first character in each case is BIT 0 and the second BIT 4, the hex number is to be loaded into the A register to set the Bit for the line being scanned low.

```
CAPS.SHIPT—V FEH
A—G FDH
O—T FBH
1—5 F7H
0—6 EFH
P—Y DFH
ENTER—H BFH
SPACE—B 7FH
```

So, for example, to read the keyboard for ENTER being pressed the program would be:

```
LD A,BFH
IN A,(FEH)
AND 1
JR Z,ENTER PRESSED
```

To see if more than one key is being pressed you could use the logical operators AND or etc if they are on the same line or bit test instructions.

Screen copy to printer: CALL 3756 (EACH) — This routine requires no presetting and a straightforward CALL will output a screen copy to the ZX printer.

Printing graphics to printer: CALL 3789 (ECDH) — This is similar to the screen copy routine in that it uses the printer buffer and outputs its contents to the printer. It is used by the RST 16 routine, which normally treats the buffer as one screen line (8 pixels high). If you place your graphics into the buffer one line at a time and then make a CALL to this address the printer will copy the buffer to the printer.

Note, however, that the layout is 32 bytes per pixel line with the next pixel line following immediately and not as the screen. The buffer is also cleared to zeros after a CALL.

Clearing the printer buffer: CALL 3807 (EDFH) — Simply clears the buffer to zeros.

Using the beep: CALL 949 (3B5H) — The DE register pair hold the length of the output and the HL register pair the frequency. 0 is high for frequency and FFFFH is low. The problem with this routine is that the duration is frequency-dependent. Hence, if you halve the frequency you double the duration for a given value in DE.

The actual figures are calculated as follows:

$$HL = (437,500/\text{frequency}) - 30.125$$

$$DE = \text{duration} * \text{frequency}$$

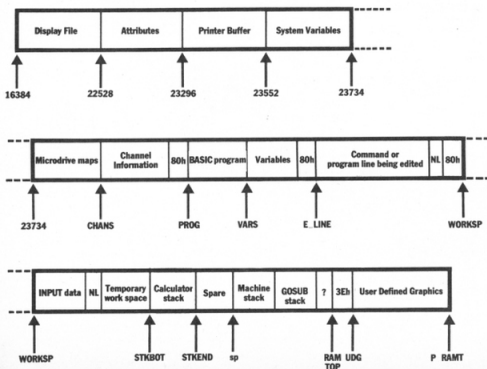
Duration should be in seconds

The reason why 30.125 is taken away from HL in the calculation is because the routine itself takes 120.5 T states to actually generate the note and amend its own registers.

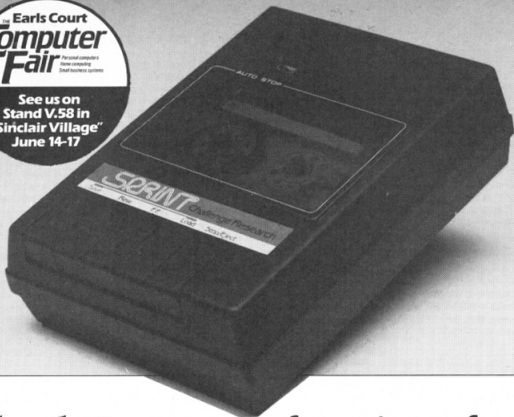
Middle C is 261 Hz, approximately, so the value for HL would be about 1646 decimal and DE for one second would be about 261 decimal.

Remember that the interrupts from the ULA will occur 50 times a second (60 in the US) and they will corrupt the sound output if the routine is in the bottom 16K of RAM.

The Spectrum's memory map



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
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PCN66

Interesting graphic routines are easily available to MTX machine code programmers, says Keith Hook.

Mastering MTX code

The Memotech has one of the most sophisticated graphic command sets available to the Basic programmer. My preference for programming in Assembler has always made me envious of the way you can manipulate sprites, draw lines and animate graphics in Basic, but after studying a print-out of the ROM and making a few phone calls to Memotech, the truth of the matter dawned on me. The ROM is so well thought out that the majority of graphic routines can be available to the machine code programmer, and are as easily implemented as they are in Basic.

The key lies with the RST10 instruction. An RST instruction is a unique 1 byte command that allows a call to any one of eight addresses in low memory. And as it requires only 1 byte to implement, it's a very fast instruction.

RST 10 is used by the MTX for at least 90 per cent of ROM graphic routines available from Basic. The MTX ROM has been written so that routines can be called by the machine code programmer from within a program just as easily as from Basic. The routines here should help machine code programmers.

The function of the RST10 instruction is to send ASCII or control characters to the screen or printer depending on which bit is set in the system variable 10PR. This article assumes that all writing will take place to the screen.

There are four command codes in which the screen restart (RST 10) can operate:

- Send X number of characters to screen.
- Send one byte to screen.
- Clear and select virtual screen.
- Output contents of BC registers to screen.

On calling RST 10, the screen restart expects to find a series of data or command bytes. The formula for these bytes is *command, data*.

The screen restart decides which command is to be executed by the bit pattern of the first byte, which is the command byte. The fifth bit of each command byte is always the CS bit (CarryonStop bit). With this bit set, and the immediate command executed, the screen restart carries on to look for another command byte. If the CS bit is reset (0), the screen restart stops after carrying out the immediate command byte.

Clear and select virtual screen

```
Bit      7 6 5 4 3 2 1 0
Pattern 0 1 CS — Cls VS Number
```

- Bit 7 is reset (0)
- Bit 6 is set (1)
- Bit 5 is CarryonStop bit
- Bit 4 doesn't matter

- Bit 3 If set (1) clears virtual screen. If reset (0) will not clear screen.
- Bits 2 to 0 specify virtual screen number.

Example: If you wish to select virtual screen 4, print 'PCN'. The formula is:

```
RST 10
DB64,83;"PCN"
```

If you run this short programme you will see PCN printed on virtual screen 4. This works as follows:

```
Bit      7 6 5 4 3 2 1 0
Pattern 0 1 1 0 0 1 0 0 = 64Hex
```

Here bits 7 and 6 comply with the select virtual screen command. Bit 5 is set, so after selecting VS4 the screen restart will carry on and look for another command byte. Bits 2 to 0 = 4 decimal and therefore the screen restart selects virtual screen 4. The next command byte is 83Hex, which tells the screen restart to send 3 bytes to the screen and as 83Hex does not have bit 5 set the RST 10 instruction stops after printing 'PCN'.

Should you wish to select virtual screen 4 and do nothing else the formula would be:

```
RST 10
DB 44H,
```

44Hex = 01000100, and as bit 5 is not set, the command stops after selecting virtual screen 4.

To select virtual screen 4 and also clear it on entry before printing 'PCN' the program would be:

```
RST 10
DB 6CH,83H;"PCN"
```

Bit 5 is now set, as is bit 3. 6CH = 01101100 = Select VS4;CLS:Print PCN

Send X number of bytes to screen

```
Bit      7 6 5 4 3 2 1 0
Pattern 1 0 CS (no bytes .....)
```

Maximum value of X = 31

This command is recognised by RST 10 when bit 7 is set (1) and bit 6 is reset (0). Bit 5 is the CarryonStop bit, and bits 4 to 0 specify the number of bytes to a maximum of 31. Study the above and you will see that if you wish to output 5 bytes to the screen the formula is 05 ADD 80H = 85H = 10000101. If you wanted to print 5 bytes and carry on to the next command, the formula would be 5 ADD A0H = A5H = 10100101. For example:

Print "GO IN PEACE" TO VS4:

```
RST 10
DB 06CH ; Select VS4 and carry on (bit 5 set)
DB 8BH ; 11 characters including spaces
DB "GO IN PEACE"
```

Obviously you can write it all on one line in actual programming:

```
RST 10
DB 06CH,8BH,"GO IN PEACE"
```

For example:

```
Print "GO IN PEACE":CLS:PRINT "THE
END":
RST 10
DB 0ABH ; Set bit 5 (carryon bit) + 11
characters
DB "GO IN PEACE"
DB 06CH ; Select VS4 and set bit 5
DB "GO IN PEACE"
DB 87H ; Print 7 characters but stop
after this so reset bit 5
DB "THEEND"; 6 characters + 1 space
```

The graphics with output X number of bytes to screen is the most useful of the screen restarts, and the bit pattern is exactly the same as the above instruction.

To understand how this mode works, see table 1. The parameters listed are exactly as printed in the Basic instruction manual. If you study the ASCII command digits, you will see that they correspond to the ASCII CTRL characters used to control the cursor, etc.

If one of these ASCII control digits follows the command byte the screen restart performs the function specified in table 1. Note that the value of the number of bytes must include the control character.

The format is therefore output X characters, ASCII command, parameters. For example:

```
RST 10 ; call screen restart
DB 6CH ; select and clear virtual screen 4 set
bit 5 carry on
DB 83H ; output 3 characters to screen and
stop bit 5 reset
DB 1,0AH,0AH ; ASCII 1 = Plot = PLOT
10, 10
```

or

```
RST 10
DB 6C,0A3H,3,2,2
DB 8EH;"THIS IS A DEMO"
```

The above code selects and clears virtual screen 4 then outputs 3 bytes to the screen.

To test your grasp of the tries, to sort out why this does exactly the same thing:

```
RST 10
DB 6CH,91H,3,2,2,"THIS IS A DEMO"
If you wanted to create a sprite the code would be:
```

```
RST 10
DB 0ABH, call to output 11 bytes
0FH,1,1, ASCII command 15 = GENPAT
64,16,16,32,128,64,128,08 parameters
```

Send one byte to screen

```
Bit      7 6 5 4 3 2 1 0
Pattern 0 0 CS (byte.....)
```

The screen restart recognises this command when both bit 6 and bit 7 are reset (0). In this mode a one byte control or command such as CLS can be directed to the screen.



Output the BC register pair to the screen

Bit 7 6 5 4 3 2 1 0
 Pattern 1 1 CS — — — —

This mode is entered when bits 6 and 7 are set (1). Bit 5 is the CarryonStop bit. Bits 4 to 0 do not matter.

For example: LD B, 41H; ASCII A
 LD C, 44H; ASCII D
 RST 10; Call screen restart
 DB 0C0H; Output BC to screen then stop. Bit 5 = 0
 LOOP: JR LOOP; Loop to preserve screen display

This will print the ASCII characters AD to the screen.

TABLE 1

ASCII Command Code	Function	Parameters
1	PLOT	X,Y
2	LINE	X1,Y1,X2,Y2
3	CURSOR	X,Y
14	CTLSPR	P,X
15	GENPAT	P,N,D1,D2,D3,D4,D5,D6,D7,D8
16	COLOUR	P,N
17	ADJSR	P,N,V
18	SPRITE	N,P,XP,YP,XS,YS,COL
19	MOVSPR	P,N,D
20	VIEW	D1R,DIS
21	INSERT	
22	DELETE	
23	BACK TAB	
25	TAB	
26	HOME	

Formula: DB (X),(ASCII Command), (Parameters) where X is the call to output X number of characters.
 $X = (\text{ASCII Command}) + (\text{Parameters})$

Table 2

VRAM locations used by ROM

Text Mode:	
Pattern Name Table (Screen)	1C00 Hex
Pattern Generator (Graphics)	1800 Hex
Graphic Mode 2:	
Pattern Name Table (Screen)	3C00 Hex
Pattern Generator (Graphics)	0000 Hex to 17FF Hex
Colour Table	2000 Hex to 37FF Hex
Sprite Attribute Table	3F00 Hex
Sprite Generator Table	3800 Hex

The Flagship...

A photograph of an Epson LQ-1500 printer, a beige dot matrix printer with a paper tray on top. A small white flag with a red pole is stuck into the printer, bearing the text 'EPSON LQ-1500'. The printer is set against a background of a blue and green world map with black grid lines.

EPSON
LQ-1500

In keeping with a long tradition of producing fine quality dot matrix printers, Epson have now launched their new flagship. The LQ-1500 is a new breed of printer, that will give you the best of both worlds. A dot matrix printer, although capable of 200 CPS in draft mode, can be set to produce letter quality at 66 CPS by simply flicking a switch.

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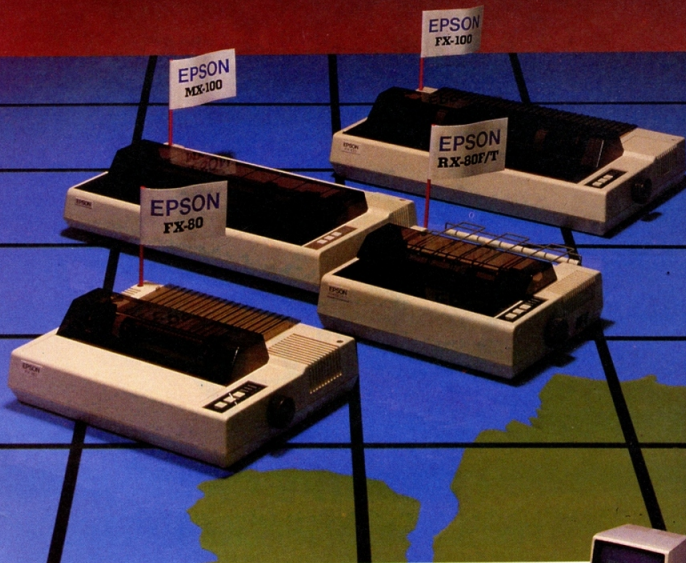
Having superb graphics capabilities and optional 8-bit parallel (Centronics) RS 232 and IEEE interfaces, the LQ-1500 has taken

its rightful place at the head of the Epson fleet of fine dot matrix printers.

Epson have been leading the field in the design and production of printers for many years. Printers that are now successfully operating in all kinds of business environments, like the ever popular RX-80 and FX-80. With speeds of 100 CPS and 160 CPS respectively, dot addressable graphics and optional tractor feed available on the FX model, these two machines are extremely reliable and widely used.

The RX-80F/T has the same

The Fleet



advanced features as the RX-80 but having both friction and tractor feed as standard, it's a totally versatile machine at a thoroughly realistic price.

With an ever watchful eye on the changing face of the printer market, Epson have identified a growing need for a high speed printer with the ability to accept wider paper. Thus was born the FX-100, again including all the advantages of its predecessors.

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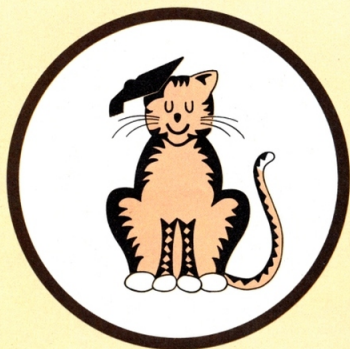
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Which book would your micro want you to buy? PCN's review pages help you choose.



If the number of books about a micro is a measure of popularity then the 64 is destined for world domination. This batch is only a small chunk out of the mountain of titles recently arrived at PCN.

The range of subject matter is heartening, though the quality is not.

The bonus in all this is that you can now afford to be choosy in what you buy: no longer is it necessary to buy simply anything to get your hands on extra information about the machine.

'Secrets of the Commodore 64' by P. Cornes and A. Cross, published by Bernard Babani at £1.95 (paperback, 109 pages).

The basic, beginner's guides continue to surface in various guises and *'Secrets of the Commodore 64'* is one. Secrets is perhaps a little too strong although the authors have pulled together some of the trickier aspects of programming the 64 and presented them in helpful isolation.

Subjects include manipulating the memory map, sprites, high-resolution and sound. Nothing particularly new, but well written with good programming examples.

What makes the book well worth the money is a listing for a Basic extension program which adds new commands, such as OLD, PLOT, LINE, and other graphics commands, plus routines to move the start of Basic — the kind of thing that would cost £10-£15 commercially.

The only criticism is that the listing is presented as a hex dump which makes it a chore to type in and offers virtually no help to programmers wanting to modify the routines.

'How to Program the Commodore 64' by Robert Young, published by Interface Publications at £5.95 (paperback, 170 pages).

'How to Program the Commodore 64' is a very basic guide to Basic but this kind of thing has been done too often and too well for this to deserve any chance of standing out from the crowd. Graphics are completely missing, as are sprites, but sound gets brief coverage.

The rest is simple stuff on loops, RND, branches and sub-routines, all of which is covered in the user's guide that comes with the machine anyway.

'Putting your Commodore 64 to work' by Chris Callender, published by Interface Publications at £4.95 (paperback, 65 pages).

Program books continue to abound and it is here that the variation in quality is most apparent. *'Putting Your Commodore 64 to Work'* is an odd attempt at businesslike software that no-one in business would dream of using. The first program is billed as a word processor. What this means is that you can enter 100 lines of 80 characters maximum and then edit them using a Basic line editor.

The other listings — database, planner, spreadsheet — are equally crude. A brave attempt has been made to pull several together in a sort of integrated package but the confusion over readership is highlighted by the fact that all these 'business' programs end with a 'bye-bye' message. Interesting for programming ideas, but not really the stuff a business executive's dreams are made on.

'Challenging Games for the Commodore 64' by William A. Roberts, published by Interface Publications at £3.95 (paperback, 74 pages).

'Challenging Games for the Commodore 64' is that old standby, a collection of a variety of games.

None of the listings is very long so the degree of challenge is quite small, but they are fun and neatly done — and the listings are so clear so there should be no trouble entering them. The arguments for and against this type of book are old now but if you want something of this kind it's as good as any and better than most.

'40 Educational Games for the Commodore 64' by Vince Apps, published by Granada at £5.95 (paperback, 188 pages).

Far more interesting is Vince Apps's *'40 Educational Games'*. Produced to Granada's usual high standards, this is a very worthwhile contribution. It claims to have contributions from educationalists and is aimed fair and square at children up to ten years.

The range of subject matter is impressive, taking in word games, simple maths, astronomy, geometry, history and geography, and there's even a neat little musical program.

Almost all the programs are presented as games — learning should be fun with a micro — but if there is one criticism it is that the 64 has hardly been used to the full: few of the programs use sprites, sound or user-defined graphics. However, these could easily be added by a reasonably competent programmer.

It appears to be excellent value at £5.95.

'Commodore 64 Tune-up' by E. Floegel, published by Hofacker at £7.95 (paperback, 169 pages). **'DIY Robotics and sensors on the Commodore Computer'** by John Billingsley, published by Sunshine at £6.95 (paperback, 127 pages).

There's also good news for the hardware buffs among 64 owners. Two titles — *'Commodore 64 Tune-up'* and *'DIY Robotics'* — offer a host of ideas for expansion and real-time control applications.

The former has a host of ideas for remote sensing operations with light and sound control, and lots of coverage of analog-to-digital and digital-to-analog conversions. Among the most useful are an RS232 interface, and a guide to EPROM programming. Most of the suggestions and projects come with assembler listings of control programs.

Equally good is *'DIY Robotics'* which lives up to its title by offering projects to construct a simple turtle and a powerful robot arm. If this sounds a little ambitious, the book begins with the construction of a simple, cheap joystick.

How to adapt the programs for the Vic 20 and PETs draws a passing reference.

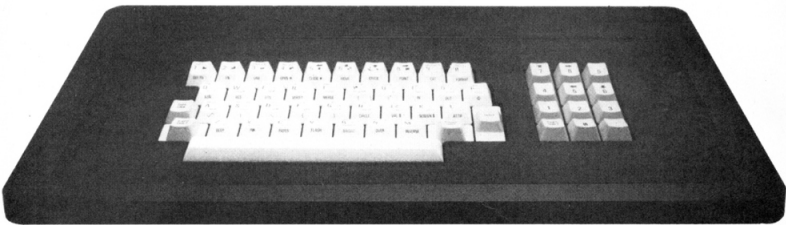
It must be said that neither caters for the absolute beginner — you would be wise to arm yourself with a reasonable grounding in electronics and soldering before attempting any of the ideas. Bear in mind that fooling around in this area will invalidate your guarantee.

On the other hand, if you're confident of your abilities and are looking for ideas and guidelines, either book will serve your needs.

Peter Worlock
More Readout p57.

Keep a Lo Profile

Another 'real' keyboard for the Spectrum has appeared. John Lettice investigates.



From the look of Advanced Memory Systems' new add-on keyboard for the Spectrum, it seems that QL fever has reached new heights. It's long, flat and black and displays the scant regard for punctuation all too prevalent in the micro business.

Advanced has christened the beast the LO>>PROFILE, but it will hereafter be referred to as the Lo Profile.

Construction

The unit seems fairly sturdy on top, this section being made from hard black plastic. The underside is much flimsier, consisting of vacuum-moulded plastic, and inversely this is the part of the case you bolt the PCB onto.

The keys themselves, the nicest I've seen on a Spectrum keyboard, are white with the legends in the same colour as they are on the original Spectrum keyboard. With a numeric keypad to the right of the main keyboard, and also a proper space bar and a caps lock, Advanced seems to have done very little rewiring in its own PCB.

This perpetuates a number of little niggles users would rather do without. The cursor keys remain on 5, 6, 7 and 8, so although you wind up with a cursor cluster on the numeric keypad it's one of the oddest you'll ever see. Similarly the full stop and comma remain symbol shifted N and M — except for symbol shift and full stop on the numeric keypad. This doesn't make for the easiest word processing, and seems to me a clear case of spoiling the ship for a ha'porth of wiring.

There are a couple of more dubious points about the keyboard's construction. The space bar on the review model had a decided list to starboard, and a hacksaw had been used to provide sufficient clearance for the ribbon cables to fit into

the keyboard's PCB (as opposed to the Spectrum's).

The case's wedge-shaped profile should improve its usability, but something else negates this. If you look at the keyboard of one of the classier word processing micros you'll quite often find that it curves gently in profile, and generally this makes it slightly easier to use. The Lo Profile's keys also curve in profile, but not gently.

The bottom row of keys projects up so much that it's practically level with the top row, and the middle two rows form a kind of pit in between. So rather than being able to lean back from the keys and look at the screen you've got to hunch over it.

Still, the good news is that Spectrum keyboards were once so thin on the ground that carping criticisms of this sort would have been pointless.

Setting up

The Lo Profile uses a series of nuts, bolts and nylon washers to hold the PCB onto the bottom of the case. It fits nicely onto the rear edge, and as the bolts go from the outside inwards rather than the more usual vice versa it should be easy enough to fit Interface 1. You then plug in the ribbon cables for the keyboard (astonishingly these are even flimsier than Sinclair's) and you're ready to roll.

At this point the reasonable Spectrum owner can be forgiven for wondering why the case is so large. It's virtually twice the length of the Spectrum, and because it has been designed so the edge connector comes out the back there's no chance of slotting anything else in the case.

In use

Two major plusses turn up with this rather than other Spectrum keyboards: it produces good audible feedback from key-

strokes, and the labels on the keys are easy to read.

It suffers from the usual problem of failing to read the second keystroke if you press the same key twice, but so far no add-on keyboard seems to have cracked this problem.

Still having to use symbol shift for punctuation is a bind, and the pitch is a slight problem, but it really is quite usable. Paradoxically, it's easier to use if you prop up the back of the case to increase the pitch. This is because it's a little high at the front, and you find that your hands don't rest too easily on the case's leading edge. Connecting Interface 1 might well improve this.

Verdict

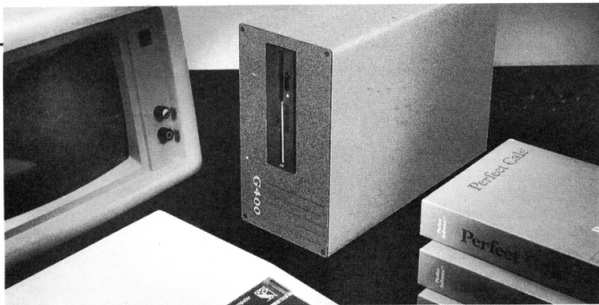
The Lo Profile represents a back to basics approach to the keyboard question — the only extra wiring involved gives you the numeric keypad, and the complete item is simply a box that you attach the usual peripherals to, just as you would on the normal Spectrum. As such it's not bad.

But both the Fuller and the Transform keyboards have extra delete and punctuation keys wired in. While the Fuller seems to have reliability problems, a working model would certainly be better than the Lo Profile. The Transform, although much more expensive, definitely outclasses it.

Nevertheless, the Lo Profile's keyboard is good — arguably better than its competitors. If the pitch of the keys was better, and if Advanced dispensed with the nonsense of having a case twice as large as it need be, it would be a strong contender.

PCN

Product Lo Profile add-on keyboard **Price** £49.95 plus £2.50 p&p **Manufacturer** Advanced Memory Systems, Green Lane, Appleton, Warrington, WA4 5NG. Tel: Warrington (0925) 62682.



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PCN PRO-TEST PERIPHERALS

The Riteman is a very attractive dot matrix printer marketed by an American company called Inforunner — though it is made for them in Japan. At a retail price of £286 including VAT its impressive array of features includes a maximum print speed of 120 cps, which is unmatched by most dot matrix printers under £300.

The excellent 9x9 matrix print quality should also place it high in the price-performance chart.

Presentation

The review printer arrived in a relatively small cardboard box with Inforunner logos plastered all over it and a plastic handle for easy transportation.

I was surprised to find the cream-coloured Riteman smaller than other, more sturdy-looking dot matrix printers.

Well-designed with a very stylish curve at the edges, it should sit well with a BBC micro or ACT Apricot.

Getting Started

The lid has been well thought out, with a good cutting edge, standing vertically when the paper is inserted and easily removable if not wanted. When shut, it reduces the noise level significantly. The paper is fed into the printer through a wire grid and a neat little pair of paper guides prevent the paper shifting sideways.

The tractors, situated at the sides of the platten, do not stick out from the lid, nor do they get in the way of the friction feed mechanism.

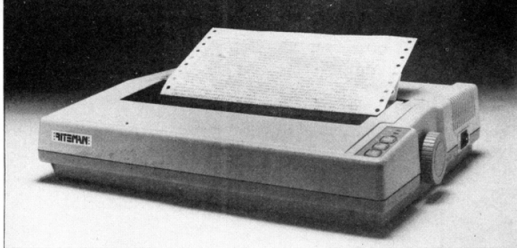
The gap between the platten and the print head can be adjusted by moving a little lever on the side of the tractor. This allows thicker paper to be used or even more than one sheet of paper to be fed in, to produce carbon copies.

The print head — again smaller than on other dot matrix printers — performs very well. Its ribbon cartridge, which clings tightly around the printhead, is so small that if emphasised or overstrike characters are used, the ink may tend to fade rather quickly.

As usual, the three control switches — select on/off line, form feed, and line feed buttons — are situated on the right hand side. Three indicator LEDs are placed just above the buttons, signifying power on, paper empty, and on/off line.

The machine has a standard Centronics parallel interface so connection to most micros should be no problem at all.

There are ten DIP switches hidden



Getting it Rite

Kenn Garroch finds high quality print at a budget price.

under a cap at the back of the printer; these switches can be set to give various options on power up. Of these options, there are four international character sets to choose from — USA, France, Germany, and the UK. Other options include 1/8 or 1/16 line spacing, normal or emphasised characters, 0 or Ø for zero, automatic perforation skip, 80 or 132 columns per line, and paper empty detection. All of these options can be changed by sending commands from the computer, bypassing the switches.

When the printer arrived, these DIP switches were not properly set for PCN's BBC Model B so they had to be reset to get the printer to work correctly. The settings vary from machine to machine and people who are not technically minded may be alarmed when the printer does not behave as expected. With problems traceable to the DIP switches, the dealer is always the best person to consult.

Manual

The manual is one of the best I have seen, written in clear concise English that will make some of the Japanese printer manufacturers green with envy. It contains everything that anyone will need to know and a lot of detailed drawings describe what to do.

The example programs are written in standard Microsoft Basic and demonstration printouts are included for every control code.

My only criticism of the manual is the lack of an index. There is, however, a list of control commands. A long section about 'trouble-shooting' gives advice on how to fix faults with easy-to-follow flow charts.



A DINOSAUR IN A FRACTAL FOREST by COOK, SATO, & NIPPONE

All the technical data for the machine is included. The circuit diagram reveals that the Riteman is controlled by a 6801 CPU, one of Motorola's 6800 family.

Options

The Riteman does not have a serial RS232 interface but this can be obtained as an extra for £45 and will probably need to be fitted by a dealer.

Features

There is a good selection of control codes on the Riteman, such as expanded, compressed, emphasised, double strike, italics, subscript, and superscript characters. (See example printout). They can be mixed and matched to produce various fonts. The 9x9 matrix gives true descenders and the double strike emphasised mode is near typewriter quality.

The paper-out warning may be switched off to allow the use of single sheets. However, there did not seem to be any means of printing on the last two inches of paper without the danger of printing on the platen after the paper had run out.

Verdict

This time last year, a printer like this would have cost well over £300 and the Riteman for around £286 is a good bargain, even with its few minor omissions. It should do very well in this growing market. PCN

Machine Riteman dot matrix printer **Price** £268 including VAT **Speed** 120 cps **Interfaces** Centronics, optional RS232 **Dealer** Micro Peripherals Ltd 0256 3232

Example printout

```
9 x 9 DOT MATRIX TRUE DESCENDERS 2xxyg
EMPHASIZED CHARACTER
DOUBLE STRIKE CHARACTERS
DOUBLE STRIKE EMPHASIZED CHARACTERS
COMPRESSED CHARACTERS
DOUBLE STRIKE COMPRESSED CHARACTERS
EXPANDED CHARACTERS
EMPHASIZED EXPANDED CHARACTERS
DOUBLE STRIKE EXPANDED CHARACTERS
COMPRESSED AND EXPANDED CHARACTERS
DOUBLE STRIKE COMPRESSED AND EXPANDED CHARACTERS
ITALIC PRINT STYLE
COMPRESSED ITALIC CHARACTERS
EMPHASIZED ITALIC CHARACTERS
DOUBLE STRIKE ITALIC CHARACTERS
DOUBLE STRIKE COMPRESSED AND EXPANDED ITALIC CHARACTER
SUBSCRIPT AND SUB SUPERSCRIPT
ITALIC SUPER SCRIPT AND ITALIC SUBSCRIPT
COMPRESSED SUPER SCRIPT AND COMPRESSED ITALIC SUBSCRIPT
```


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PCN PRE-TEST HARDWARE

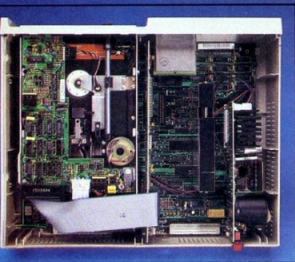
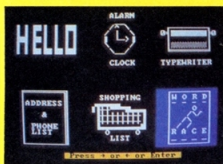
Kenn Garroch swings with IBM's newcomer to the jungle.

The PC jr or Peanut is IBM's bid to win a place in the home micro market. Since they have done so well in the business area this, at first sight, seems like a good idea, though at a cost of around £1200 it will probably be rather too expensive for a home micro.

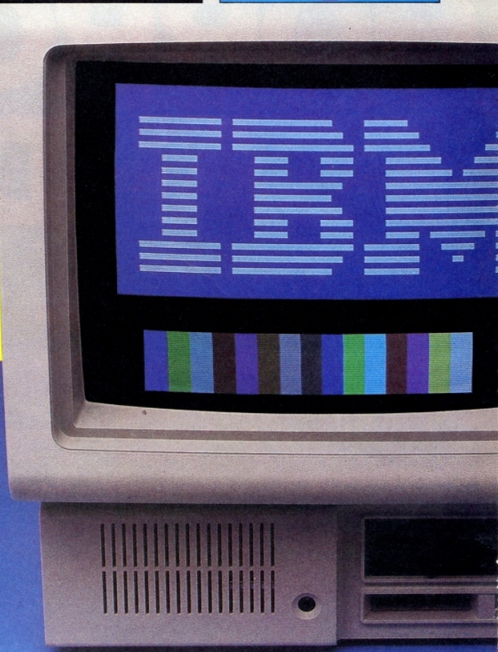
The PC jr comes in the usual two pieces of the keyboard, with its infra-red connection, and the brainbox containing the processor, memory, disk drive, cartridge slots and so on. This box measures about 18in x 4in x 18in—quite a bit smaller than that used on the IBM PC sr—and is distinguished by the two cartridge slots under the disk drive. Also quite light, it has a cooling fan which is pretty quiet and soon becomes unnoticeable, even in a quiet room.

On switching on, the colour monitor comes up with the famous Big Blue logo and a test pattern across the screen showing all the colours available. The review machine had 128K of RAM and, as the machine did its memory check, this could be seen ticking away at the bottom of the screen.

Most of the boot-up options are similar to those for the IBM PC but some are a



The kernel of the IBM Peanut sports a 64K memory expandable to 128K.





little different. If no disk or cartridges are inserted, the system boots up into the onboard ROM Basic. As with the larger PC, this system has the nasty habit of trying to access the disk before deciding there is nothing in the drive and running Basic. The version of the language in the ROM is cut down compared to the version available from the cartridge and appears to be identical to the one on PCsr, probably due to them both having the same ROMs.

If, before booting up the machine, a PCDOS system disk is inserted into the machine, the junior boots up into PCDOS 2.10. This allows the machine to run virtually all the software available that will run in 128K for this operating system. It will run Wordstar but, unfortunately, won't run the IBM Microsoft Flight Simulator, though it may well be possible for Microsoft to remedy this. The PCDOS operates in exactly the same way as on the large PC, with access to all the standard commands and features.

Storage

There are two main storage media available on the PC jr: cassette and disk. The disk is actually an upgrade and the smaller machines run purely on cassettes and cartridges. The single disk drive gives 180K of storage which, according to the DSKCHK routine, is actually 179712 bytes. When running Basic programs this is quite adequate. But if the system is to be used under PCDOS it could turn out to be

pretty limiting. When all the system files have been put onto the disk only 23552 bytes are available for use. Using Wordstar, that's around 3000 words if they're short ones.

The disk access times appear to be similar to the PC sr. When it is grinding away, the system ignores typing ahead but, strangely enough, gives out little beeps indicating that the keyboard is being monitored but the characters are not being stored in a buffer.

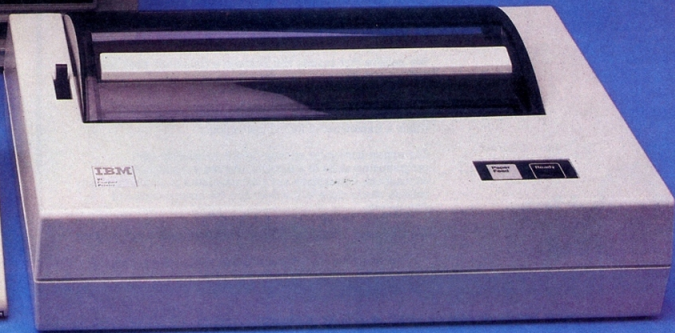
The amount of RAM available for use is 114688 bytes and will vary a little with the type of screen display used, leaving as little as 81920 bytes for programs — quite a lot for a home machine.

One unusual feature is the availability of cartridge software. Two cartridges came with the review machine — a game called Mine Shaft and the Basic, IBM/Microsoft version J1.00. The game is not terribly exciting and the screen display consists of block graphics and defined character shapes. If they are anything to go by, cartridge software will have to increase in quality and quantity if it is to sell at all well.

When a cartridge is inserted, the machine reboots itself and goes through all the hassle of accessing the disk drive, to see if a disk is present. If there isn't, it will eventually boot the cartridge. The left socket is tried first, but the machine is not fooled by placing a cartridge in the right socket and boots that one if there is no left cartridge.

35 ▶

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Display

The display is capable of producing 16 colours and a maximum of 640x200 pixel high resolution graphics, depending on the screen mode being used. In the highest resolution mode, the graphics are 640 by 200 dots but the range of colours is reduced to four.

The colours come in two palettes giving options between green and cyan, red and magenta, and brown and white plus all the usual blues and greys.

To begin, the display is in 40 columns. When used with PCDOS it is not really very much use. A utility is supplied, from PCDOS, which changes this to an 80-column display, allowing the directory and the business software to run properly. If used with a TV set, this 80-column mode will probably be virtually unreadable, but

impression that nobody has really tried anything clever yet.

Documentation

The documentation supplied with the machine comes in two manuals and a book. The manuals are in the usual IBM-sized folder-type packaging. The first is a guide to operations and is obviously aimed at the younger user with wealthy parents. It is written as a guide to getting the machine going and is full of pretty little colour illustrations of children using the complicated facilities available, like pressing the buttons on the keyboard. This very

If you like space between keyboard and computer, the infra-red link does away with cables. In fact, the keyboard can be used at a distance of up to 20ft.

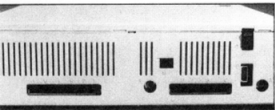
simplified manual shouldn't pose problems to anyone, that is if they bother to read it.

Sections outline some of the differences between PC jr and PC sr.

In the appendices all the instructions have been included to allow the system to be upgraded with the usual line drawings showing how to take the machine apart and fit disk drives and so on.

The second manual, covering the Basic in detail, is a lot more up-market and vastly more useful than the other book. Each keyword is documented and graphics and communications options are covered. It's all in all an excellent manual for the programmer.

The 430-page Basic tutorial volume, *Hands on Basic*, leads the new user, in a series of sessions, from switching on the machine to the use of arrays. It is well



The ports, mostly at the back of the machine's brainbox, connect the various interfaces.

with a monitor it gives a fine solid display. From Basic there are seven screen modes available giving the different resolutions, colours, and so on.

The character set includes upper and lower case letters, numbers, continental characters, and a set of predefined block graphics. The last may be of some use when writing games and can be obtained directly from the keyboard by using the control key as a shift, Commodore style, though they are not printed on the keyboard.

The high-resolution graphics are quite good but the commands to use with them are a bit feeble. They are fairly fast, however, and should allow some nice games to be implemented. But as we said above, the game supplied on cartridge does not use any of these facilities and gives the

Insert a cartridge into either socket and the PC jr re-boots, and tries to access the disk drive. If there isn't a disk present, it will eventually boot-up your cartridge.

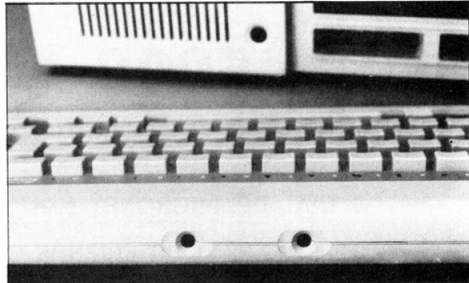


Table 1: Screen Display Modes

Mode	Descr	Width	Mem-size	Colours
0	Alpha	40, 80	2K, 4K	16
1	320x200	40	16K	4
2	640x200	80	16K	2
3	160x200	20	16K	16
4	320x200	40	16K	4
5	320x200	40	32K	16
6	640x200	80	32K	4

illustrated in full colour and aimed at the novice user. Most users will probably outgrow this book in a couple of weeks and, since it doesn't provide very much reference material, it will soon become redundant.

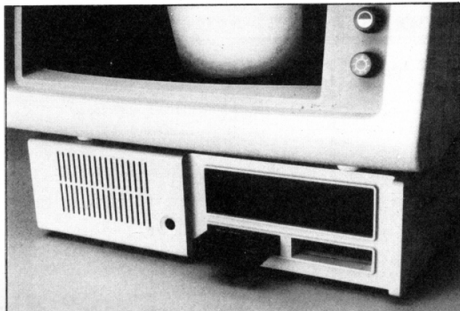
Interfaces

Interfaces available on the machine range from the infra-red keyboard connector, audio output, joysticks, cassette, composite monitor, IBM monitor (RGB), light pen, serial printer (RS232C), modem connector (110-300 baud), TV and output to the real keyboard connector. Most of these are at the back of the machine and are denoted with letters such as S for serial and C for cassette.

There appears to be no documentation on exactly what these letters mean and though most of them were pretty obvious it is possible some users may be a little confused.

The modem speeds available are only 110 and 300 baud so connecting to Prestel could be a problem when using the IBM modem. But it should be possible to use the other serial output, which allows the usual range of speeds from 75 baud up to 4800 baud.

The two other standard speeds, 9600 baud and 19600 baud, did not seem to be implemented.



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Keyboard

Smaller than average, the keyboard does have the usual 62 keys. Its main feature is its infra-red link, which means that the keyboard is not physically attached to the main computer and can be moved around the room while the keys are being pressed. It is possible to operate the keyboard up to 20 feet (6.1 metres) away from the machine.

When the keyboard is so far away that the computer cannot understand the signals that are being transmitted, it objects by giving out a little beep. Aside from the difficulty of typing with one hand, while holding the keyboard with the other, the infra-red link makes the keyboard ideal to use on the knees while reclining in an armchair.

At first sight the keyboard is a little tacky and resembles an oversized Oric. After a while it becomes quite easy to use, although touch typists will not like it. An

hitch which can prove confusing.

There is an optional keyclick that can be turned on or off, but is hardly necessary since the keyboard does have a positive feel and there isn't really any doubt as to whether a key has been pressed or not.

Software

The Basic supplied on cartridge is far superior to the internal ROM version and gives access to a whole host of commands including a set of interrupt traps for the keyboard, a light pen, the joysticks and the on-board timer. In addition to these, there is a While loop, a trace function and full RS232 controls.

As Basics go, this one is a very comprehensive version of the standard Microsoft.

The PCDOS is version 2.10, which is very similar to version 2.0. All the normal

cartridge or cassette software and as this type of machine it performs well. But few people will want to use it for this, considering the price of the overall system.

Its second role — as a programming machine — uses the cartridge Basic and the cassette or disk for storage. Programming is easy and in general uses very standard Microsoft, with the usual editor and associated commands. Additional commands available, such as the error and the interrupt trapping and the joystick input, will make it very easy to write games.

Other facilities such as the RS232 control commands mean that it should be relatively easy to implement quite a sophisticated communications package. The graphics are easy to use from Basic and, using the excellent Basic manual, drawing pictures and general full colour graphics is quite straightforward.

The third role is as a business machine running PCDOS. The disk drive will need to be fitted to access the plethora of software ready to emerge for this system, but as an upgrade most users committed to the machine will find it quite a good deal. When running under PCDOS the PC junior operates just like an IBM Personal Computer but does have the problem that it is limited to 128K.

The disks are the same format on both machines so swapping software between them is no problem.

Verdict

Given time to adapt to the idiosyncrasies of the keyboard, users will find the PC jr a comfortable little beast with no nasty habits. Its PC sr upwards compatibility may find it a niche in the home computer market, with the fact that it is made by IBM also having something to do with this possibility.

It is not yet available in Britain, unless it has been specially imported as had the review machine. IBM was vociferous as ever when questioned about the matter and neither confirmed nor denied whether the junior would be released or possibly made in Britain.

A few IBM dealers may have imported it, pointing to the possibility that IBM wants to see how it will be received before committing itself to a major effort.

Considering the price and what comes with it, it may well not compete very well in this country due to the number and quality of home machines already available. **PCJ**



The PC Jr's 62 colour-coded keys help users to follow the function and Alt key combinations.

odd feature is the way the letters and functions of the keys are not printed on the keytops but above them, on the backplate. From a normal typing position, with the keyboard level, it is not possible to see what the keys do. The solution to this problem is to use the little clip down legs on the bottom back of the keyboard to enable it to be tilted at a better angle.

All of the keys are colour coded, making the function and Alt key combinations easy to follow. The ten programmable functions are obtained by pressing the green function key and then the appropriate number.

There does appear to be a little problem with the keyboard buffer when using the function keys in Basic. If a long word is defined into a key and then the key is held down, eventually the buffer fills up and the key reverts from producing its function and produces the key number instead. This is not a major problem but it is a

commands are available, and although no manual was supplied with the review machine, presumably one comes with the disk upgrade.

In use

The PC jr can be used in three main roles. The first is as a games machine with the

SPECIFICATIONS

Price	Possibly around £1200
Processor	8088
Memory	64K expandable to 128K
Interfaces	Two joystick inputs, RS232 serial
Cartridges	UHF TV, IBM Monitor, Composite Monitor, two cartridge ports
Keyboard	62 Keys, including 10 function keys
Screen	20×25, 40×25, 80×25, 640×200 high resolution graphics (lower resolution possible with more colours) 16 colours maximum

Operating system Basic or PC-DOS if upgraded.

● Preview system supplied by Bonsai Ltd, 112 New Oxford Street, London WC1.
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GAMES

The most exciting release this week was *Encounter* for the Commodore 64 and Atari, which has drawn rave reviews and ratings in the US. Of similar style is Micromega's *Death Chase*, but it's not nearly so polished. You zoom around pillars, checking for attacking saucers on your radar through a number of skill levels. The smooth scrolling and high-quality graphics defy description.

Also on the 64 is Terminal's *Triple Tournament*, from Australian-based Ozisoft. It offers three games on one cassette: *West World*, *Space Race* and *Kamikaze*. Each requires a joystick. Early mainframe star *Classic Adventure* is now available for the 64 as well as the Spectrum, courtesy of Melbourne House.

Battle Planet on the BBC is a competent version of the *Star Wars* theme of flying down a

trench to launch a plasma bolt at the Battle Planet's vulnerable spot, avoiding Robot Fighters' energy bolts as you go. Also for the BBC's *Monsters Magic*, an adventure where you define your character's attributes. Following the success of *Zalaga*, Aardvark has brought out *Frak!*. The excellent graphics make the Beeb look like an Atari or Commodore 64. Crystal's *It's the Wooluf* doesn't justify the high hopes raised by *Halls of the Things*. You control a sheepdog to round up a flock before the wolf does and being thick the sheep are likely to fall in the river.

Micro Chess games are popular anyway, but *Death Chess 5000* has an unusual feature; you intersperse normal play with arcade-style games. For example, to take a rook with a rook you must scale a tower and avoid falling barrels. The standard of chess may not be up to White Knight II or Colossus Chess, but the diversions are interesting.

The Quill is used in two Spectrum offerings from RuneSoft — *Spoof* parodies micro adventures, while *Paradox* requires serious thought. Brainbox's *Enigma* joins the new prize-winning trend by offering

Spectrum owners the chance to win champagne. Latest of the 'pocket-money' games is *Froot Loop* from NTD, at £3.

Dragon Data uses shades of grey instead of colour for its graphic adventure *Sea Quest*. A rolling boulder, a waterfall and waves show clever use of this graphics technique.

UTILITIES

BBC owners may find *Simplex-B* handy. It's a conversion from the Commodore 8000 series accounting program based on the 'Simplex D' method of book-keeping. Versions are available for the Commodore 64 and the MZ80A, and the system is geared to small business. Micro-Simplex offers free upgrades and a hot-line through a Simplex-B user group.

Commodore 64 owners can buy ISP's *Scope 2*, a 'games language' package already available for the Spectrum. Unlike *Scope 1*, it compiles your programs and doesn't need a run-time module.

Neither a utility, nor a game is *Chart* from Juke-Box. This displays sales of more than 3000 pop records since 1969, listing titles and artists and using coloured charts to plot the progress of a record through the

charts. An unusual program which, sadly, lacks hard-copy and search facilities.

Dragon Data's *Astrology* won't tell your fate. It's a dedicated calculation package for astrologers to estimate, say, your natal horoscope under the Tropical zodiac, according to Koch, Placidus or others.

EDUCATIONAL

Ahead of the crowd is Dragon Data's *LOGO*, though at £39.95 it's a costly cartridge. However, a disk version is due soon and it may be released on cassette. This is a powerful package with a variety of applications for a wide age range.

It incorporates features for use with multiple turtles, like *HATCH* to create new turtles; *SEND*, to pass parameters to them; *SHAPE*, to define their shapes, and many more. It's also possible to write games — there are input commands for keyboard and joystick and you can put text on the screen. The turtles move so fast it resembles a sprite-generating package. Billed as part of Dragon's Data's 'Young Learning' series, it may get most attention from those wanting to try a different language.

PCN

BBC

Budget	£9.95	Micro-Aid 0209 831274
Frak!	£8.95	Aardvark 04024 53131
1984	£6.50	Incentive Software 0734 591678
Text Editor	£9.95	GSoft 01-521 3371
Character Generator	£9.95	GSoft 01-521 3371
Multibase	£9.95	GSoft 01-521 3371
Enigma	£6.00	Brainbox 01-930 1612
Battle Planet	£6.95	ISP 01-351 5867
Monsters Magic	£6.95	ISP 01-351 5867
Simplex-B	£250.00	Micro-Simplex 0625 615000
Sea Adventure	£7.95	Virgin Games 01-221 7535

Sea Quest	£7.95	Dragon Data 0656 744700
Shenanigans	£7.95	Dragon Data 0656 744700
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Apple's instant artist

Helena Siedlecka discovers a talent for design using Penguin's new graphics package for the Apple.



The CGS palette and brush options.

For Apple users who've found that tasks always seem to need more graphics facilities than one has on tap, the Complete Graphics System from Penguin Software is now available in the UK.

A set of versatile graphics utilities designed for programmers and non-programmers alike, it contains almost everything needed to draw pictures, graphs, plans, maps and perspectives.

Presentation

The disk and manual come in a slim foam-packed cardboard box with a wrap-around cover the size of a thick paperback. The front cover shows a smart airbrush illustration and the back cover's tempting screen shot of the palette describes what you can do.

The otherwise-dull parts of the documentation have been made light-hearted and amusing. For example, cartoons on the disk sleeve remind you NOT to store your disk at the bottom of the budgie's cage, in the toaster, in the back pocket of your jeans, and so on.

Features

This new version of the Complete Graphics System II combines various programs, all compatible with their brothers and sisters in the Penguin series. Using this system you can design a house in 3D and look at it from any angle, paint it in 100 colours with 96 brushes, add text, turn it upside down, and more.

However, the title, Complete Graphics System, might be an overstatement, since it lacks a printout facility, and animation. This is because these are complex functions, best handled by other, more specialised programs.

Any graphics created with the system can be printed using the Paper Graphics program, or made into presentations using the presentation system, Transitions. Animations can be added with The Graphics Magician.

It's compatible for use with a paddle,

joystick, trackball and touch tablets such as the Koala Pad. It also supports the new Apple Mouse, as well as the Apple Graphics Tablet and Houston Instruments' Hi-Pad. But if you don't have any of these you can still use the keyboard.

In use

Since the disk is copyable, it is best to work with a copy and keep the original in a safe place. Placing a copy of the master in the disk drive and turning on gets you to the Main Menu.

Depending on the type of input device you have you type a number from 1 to 4. From here you can choose the drawing facility you need. But it's a good idea to first check the disk-access defaults; the program- and data-disks can be redefined. The usual way is to type 1 or 2 but this would be a mistake here, causing problems later, such as a DOS Syntax Error. The correct procedure is to type D1 and D2 if you have two disk drives, of D1 if you have one drive. A more intelligent parsing routine would be an idea. Of course, you can add this, since it's an unprotected program.

To test the capabilities of this package, I elected to design a computer graphics work station, with shelves for books, monitors, a printer and so on, starting with a 3D wire model.

As my preferred input device is a Bit Pad, I typed in 2 and selected the 3D Panel Creator from the Main Menu by typing P. This option enables you to construct your design in 2D as flat panels which are saved in a 3D format. To see them on the screen assembled as a 3D image, they are loaded into the 3D Viewing Program. Editing can be done using the 3D Point Editor program.

With the 3D Panel Creator, you can recreate an object of specific size by setting the scale on the screen. The scale can be altered by changing the distance between the two dots on the screen.

You can only use the keyboard to draw in this option. That seems limiting if you have grown accustomed to touch tablets or similar devices. However, you could also add alternative input devices, such as the Gibson Light Pen, which may be the only advanced pointer-device which isn't supported.

Drawing every flat surface of the work station, filling in all the details and reassembling it in 3D to scale would be quite complicated and time-consuming, in spite of the simplicity and efficiency of the program. So instead I decided to experiment with the colour palette.

To get out of the 3D Panel Creator I pressed M which brought me back to the

Main Menu. Keying in the number for the Bit Pad allows access to the drawing screen and colour palette. Input device controls consist of single key press commands even a gorilla would find simple.

Pressing the spacebar flips between the colour palette and the drawing screen. If you want any drawing functions displayed alongside the palette, you point at it using your input device, which controls little arrows on the screen.

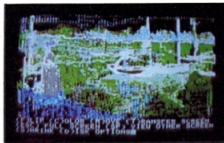
Penguin has made the most of the six primary Apple colours by texturing small areas with a variety of coarse to fine patterns, creating lighter and darker tones. In my dabblings I found these textures particularly effective for landscaping, and I imagine they would be ideal for use in graphs, maps, architectural symbols or any graphic work that does not have too much detail, or requires hatching.

I used a variety of small and large brushes from the 96 brush screen and as in normal painting it is best to start from the back and work forward, using broad strokes to lay down the base colours, later picking out the details with a small brush. Results can be achieved quickly and easily.

Verdict

The Complete Graphics System's comparatively-sophisticated set of facilities would take months to fully explore. It would be useful to a commercial artist for anything not too detailed, and is well ahead of comparable packages in this price range. Add the related Penguin programs, and you'll be well away, and at reasonable cost.

PCN



A complete picture — below are CGS options.

RATING (5)

Features

Performance

Documentation

Reliability

Overall value



Name The Complete Graphics System **Price**
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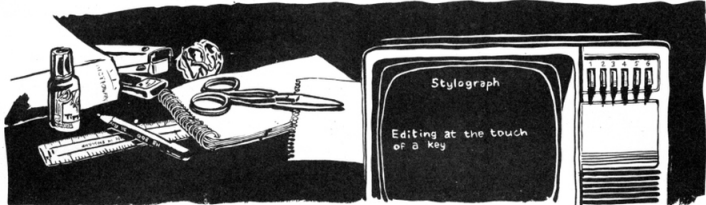
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Dragon in Style



Stylograph, along with Dragon Data's other OS9 packages, begins to make the Dragon 64 a viable small business machine. The new word processing package includes a spelling checker and a mailmerge facility and offers Dragon 64 owners a very powerful business tool.

Getting started

Stylograph comes on a single disk with a tutor/manual, leaving less than 4K of disk space for text files. Making up a working version isn't just a question of backing up the disk, you have to know a bit about using OS9: creating boot-up files, directories and the like.

Although Stylograph is hampered by the Dragon's limited Video chip, this has been overcome by the now standard trick of drawing text on one of the Dragon's high-resolution graphic screens.

The text resolution is 51x24, but Stylograph allows line lengths of up to 150 characters. This lets you use the VDU screen as a window over your text, using the 7 and 9 keys for left and right scrolling. This is ideal for use with 132 column printers. It would be better if the program scrolled text automatically like Wordcraft or Wordstar, but at least the program is entirely under your control.

You must use Stylograph on the high-resolution screen, but this does take up an extra 6K of valuable RAM and you need another 22K for OS9. You configure Stylograph with commands such as 'os9 STYLOGRAPH # 15K', which loads the program and reserves 15K for workspace. This figure is not the actual amount free for text, however; on close examination it gives 8,900 characters which is only four or five pages of A4. Microdeal's Telewriter gives you 18,500 characters, but Stylograph has a new command which stores those 8,900 characters on disk and thus allows you to create disk files larger than the RAM space available.

Similarly, the mailmerge package lets you print a number of small files sequentially.

Multi-user/multi-tasking

A cursory knowledge of OS9 is essential for using Stylograph and the more familiar you become with this powerful operating

PCN PRO-TEST SOFTWARE

There's a new edge to Dragon's tongue, says Hywel Francis.

system, the more you'll get from Stylograph.

As OS9 has multi-user and multi-tasking there's a built-in password facility to secure sensitive documents from prying eyes. You can have background printing of a text file while you work on another. In fact, the command for this would begin, 'filename > p < /p & . . . ' very similar to a Unix command for the same task.

In use

Many of the commands are Control or Escape sequences and initially remembering which keys do what can be difficult, but no more so than the BBC's View or Wordstar's Control codes.

The ':' key takes you to insert mode, shown as a row of inverted minus characters on the screen. Pressing '1' overwrites a single character and CLEAR ? inserts a character.

Deleting text presents more than one option: single characters, whole words and blocks of text can be deleted via Control commands. Unusually the block delete facility checks whether you really do want to 'Delete n characters?'

There are search and replace functions and Escape commands move the cursor from character to character, line to line, screen to screen or jump to any page number.

One of the biggest attractions of word processing is the ability to move whole sections of text around a document. Stylograph allows you to mark a section of text and cut or copy it before pasting it somewhere else.

In Edit mode, Control A calls up a help menu: there are six help files on the disk and the tree menu system is very easy to learn and use.

When you're happy with your text you can insert any of the 32 formatting control codes which have the general form ', ll n'. ', ll' is the code, such as ', ju' for justification on; ', ce' for centred text; ', pp' for new

paragraph and so on. The 'n' refers to the number of characters.

You can also use Control commands to underline, overstrike, use sub- or superscripts and so on. There are also some very useful commands for specifying that a given paragraph needs a certain number of lines on the same page and so on. The list is impressive.

Spelling

The spelling checker lexicon contains an astounding 42,000 words. Wordstar, probably the best-known word processing package has about half this. The words are stored on disk in compressed format and you can disassemble this using the SPELLCDM file, found in the STY directory. The command line SPELLCDM /DO STY/DICT lists the dictionary to screen. Adding /P sends the list to a printer. The resulting information cannot be saved to disk since in its compressed form it takes up some 400K. Be warned — 42,000 words take a long time to be printed and use a lot of paper.

Verdict

Stylograph is an extremely good program with the added bonus of being easy to use. Wordstar as a complete package for CP/M systems comes at £350, but Stylograph has twice the spelling lexicon, nearly all the facilities of Wordstar and at £79.95, it's very good value.

It's difficult to compare word processing packages, since beyond a certain level of quality you start talking about personal preferences. However, Stylograph is one of the most professional packages I've used on a home micro.

PCN

RATING (/5)

Features
Documentation
Performance
Ease of use
Overall value



Name Stylograph Price £79.95 System Dragon 64, OS9, 1 Disk Format Disk Other versions None Supplier Dragon Data 0656 744700 Outlets Mail order/Retail.

From race-tracks to vampire castles, Bob Chappell puts his Model B through its paces.



Beeb diversions

BLAGGER



Addicts of the type of game in which progress to an ultimate victory comes by conquering a succession of different screens, should find *Blogger* provides satisfaction.

You control Roger the burglar whose main interest in life is robbing safes. Roger's in a robber's paradise in this game with no less than 30 safes to crack.

But there's only one safe per screen and it's placed among a tortuous combination of ladders, platforms and escalators. Moving hazards, varying from steam trains to flying saucers, have to be dodged. No safe can be opened until five keys, strewn around the chamber, have been collected.

Each screen aims to test intelligence, reflexes and patience. With colourful, chunky graphics and decent sound effects, *Blogger* should keep you safely occupied for many hours.

OVERDRIVE



Want to win the world driver's championship without a hair out of place or an oilstreak to your face? Although *Overdrive* doesn't come up to the standard of *Pole Position*, it's still an enjoyable enough racing simulation.

Set amid green turf and stretching away into the mountainous distance is the track, a black surface edged with broken white lines. Your view is from above and behind your purple racer while all the other cars are blue. The four controls — left, right, accelerate, brake — are all accessed via the keyboard. Pity, no joystick option.

As your car travels, the track and turf scroll rapidly away to create the impression of movement and speed. Other cars are out on the track. Dawdle and you get struck from behind; get careless and you'll collide with one in front.

The perspective graphics are well up to standard although the constantly straight road (no

bends at all) does tend to detract from the challenge. To compensate, there are five different environments to drive through — sunny, night, snow, desert and riverside.

The best race simulation I've seen on this machine, it's excellent value for money.

VAMPIRE CASTLE



If adventures are more your choice of meal, this is worthy of your attention. It's a gem of a text adventure.

As should be obvious from the title, *Dracula* is on the loose again and needs to be silenced with the usual stake. There are some nifty puzzles (what use is a toy set of vampire teeth?) and interesting developments — *Dracula* may be able to sprout wings but he can't compete with your parachute or hang-glider. And a slowly melting ice-block should help to freeze the blood in your veins.

The sound effects and occasional graphics enhance the fun.

Definitely one to go bats about.

FIVE SPHERES...



Shades of the Marie Celeste. You are inmate on board the stellar prison ship *Goliath* and awaken one morning to total silence. It seems the ship has been abandoned during the night. Can you escape from your electronically-locked spaceship cell before you starve to death? Can you discover why the ship is deserted — or is it?

A text adventure with an interesting plot, fast response time, use of function keys, musical introduction and occasional sound effects, this is also good value for money.

THE GREEDY DWARF



This text-only adventure also uses a traditional theme — treasure hunting through dark and dangerous labyrinths.

Sporting the most handsome

packaging I have seen for an adventure program, *The Greedy Dwarf* sets you on a quest into the catacombs to capture three precious jewels stolen by Arfa, the greedy dwarf.

You begin your mission at the top of a spiral staircase, your essential lamp nearby. The king won't let you change your mind so down the stairs you go. All too soon you'll have tumbled down traps, been nibbled at by rats and speared by stalactites. No doubt you'll soon learn how to deal with these — but there's more where these come from.

A little slow on the response side but certainly as good a danger-filled dungeon as you could wish to explore in.

ANSWER BACK



In a quieter but no less cerebral vein comes this general knowledge quiz program aimed at 12-year-olds and over, with 750 questions spread over 15 different topics.

Several features set this quiz program apart from others. Not only can the questions be presented in a variety of ways (multiple choice, true or false, incomplete answer) but you can create, save and edit your own quizzes. The number of questions in a quiz can be restricted and there is a pass facility, with an option to retry passed questions at the end. Scoring is carried out automatically and a timing option is available.

To make the quiz more palatable to youngsters, the questions are fired at the screen by an animated robot who will also let players try to shoot down a flying saucer every time they answer correctly in this enjoyable, entertaining and educational program.

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Overdrive £7.95, Superior Software, Leeds (0532) 842714
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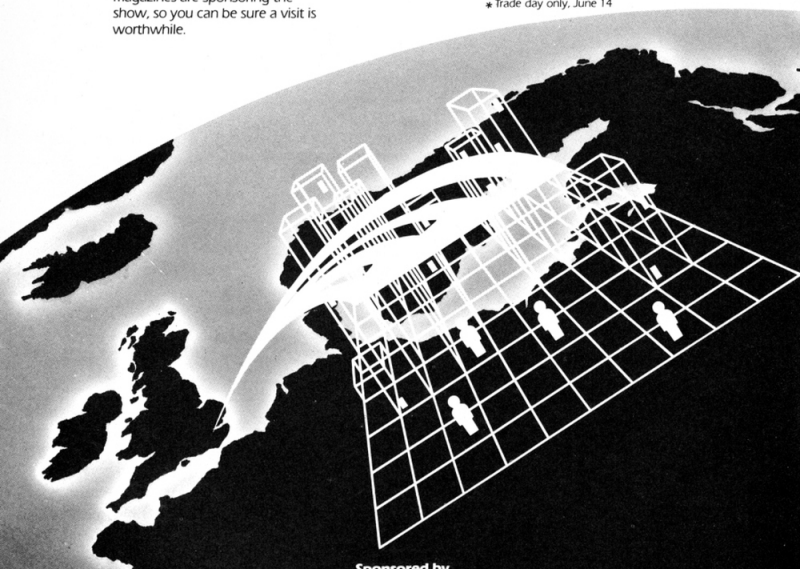
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COMMODORE 64

Down the drain

Name Pub Quest System
Commodore 64 Price £5.95
Publisher Dream Software Ltd,
 PO Box 64, Basingstoke RG21
 2LB (0256) 25107 **Format** Cassette
Language Basic and machine code
Other versions None **Outlets** Mail
 order/retail

Drunk or sober, *Pub Quest* is both difficult and amusing.

Objectives

You have wandered into your local and become totally inebriated, only to find you have no money to pay for your massive consumption. You must stumble off to find the money to pay the worthy landlord. But the money is hidden somewhere in the local sewer system. Perhaps your wallet fell out of your pocket and into the drain in your mad rush to get to the pub? Many other hazards litter your way to the money.

There are extra options, the function keys are assigned commands for the game, and single keystroke entry is possible for the more common commands. You can redefine the function keys for other commands.

In play

Before starting you must set a time limit of one, two or three hours. There is a 'time' command to see how long the game has to run. Also, a freeze command suspends the adventure. The game starts outside the pub, and the first phase

deals with finding helpful articles (key, torch, etc). Next, you must find the way into the sewers and to the money.

Cultivate an enquiring mind as this attitude may save you losing the game.

The commands are given in the usual form: GO NORTH, INVENTORY, TAKE KEY and CORE are just a few examples. There is also the HELP command which is unfortunately only sometimes of assistance. You'll enjoy the game dialogue. It's extremely witty and only a little repetitive.

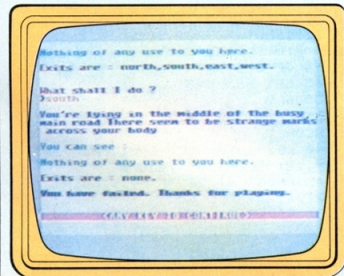
One feature should not go unmentioned. If you fumble the commands repeatedly, the game asks whether you are stuck or just being silly. Should you reply you are stuck, information is given. Should you admit to being silly, the 64 resets itself but press any other key and the game continues with a 'that fooled you' message. Tampering with the game produces a cryptic response and disables the 64; these two features are done well and add to the game.

Verdict

For a text-based game, *Pub Quest* is well above average. It makes reasonable use of the 64 and the response time is good. For its price it is certainly worth adding to the collection and will provide a good deal of entertainment.

Kevin Bergin

RATING (/5)	★★★★★
Lasting appeal	★★★★★
Playability	★★★★★
Use of machine	★★★★★
Overall value	★★★★★



Poles apart

Name Chinese Juggler System
Commodore 64 Price £6.90
Publisher Ocean Software (061)
 832-9143 **Format** Cassette **Language**
 Machine code **Other versions** None
Outlets Retail/mail order

Struggle and juggle with the plates, balance and spin them or crash them on the floor.

Objectives

Your task is to collect plates, place them on poles and keep them spinning. This is the main theme throughout, though there are variations on each level.

In play

The graphics are among the best produced for the 64. A curtain lifts to display the oriental juggler and take you through the demo mode. Ocean seems to have forgotten nothing in this game — response time, movement, music, graphics and colour are all good.

The game needs a joystick in port two. In Level 1 you must collect the plates singly and spin them on the poles. There are eight poles, so you must be quick.

To pick up the plates, position the juggler alongside a plate and press the fire button. Then move to an empty pole and press the fire button again and hey presto you have a spinning plate. There are two problems with this — the juggler's position must be absolutely accurate and the game gets faster after each plate has

been positioned on a pole.

The plates are different colours, denoting different spinning times. For instance, white is the longest and purple the shortest. The player may change the colour of the plates by tossing them in the air. Be wary when doing this as a plate is lost if it turns black. A time limit adds to the manic flavour of the game.

The action is substantially different after the first level. On level two you must pick up a specific colour plate. If the colour you're after is not available you must pick up one of four plates and toss it in the air until it turns to the colour needed or it turns black and is lost. Spin the plates already positioned and the colour of the next plate you need to pick up changes.

At each level the game speeds up considerably. I managed to complete five levels and struggled with the sixth (score 35000 approx).

After each level you complete you're rewarded by an amusing little display. The first two displays are juggled around in varying combinations when you complete levels three, four, five and six.

Verdict

Chinese juggler has many original and exciting features, and true to Ocean's style, the programming remains excellent. A high quality game that will provide hours of fun and frustration.

Kevin Bergin

RATING (/5)	★★★★★
Lasting appeal	★★★★★
Playability	★★★★★
Use of machine	★★★★★
Overall value	★★★★★

MULT MULT MULT



This program from Thomas Tate of Bigton, Shetland, tests your skills of addition and subtraction on the Sinclair Spectrum. The program uses user-defined graphics and BEEP commands to create this little arcade-style game.

A sum will appear on the left of the screen, with a grid of numbers shown on the right. The idea of the game is to calculate the missing number in the sum and then move your tank to the correct level on the grid and take fire. If you hit the right target then the number will move out and position itself in the sum. If, however, you miss your target you will be mercilessly bombed from a plane passing overhead.

You have three tank-lives in this game, although you could quite easily adjust that number by allowing the variable J to be increased or decreased. As it stands, when J (the variable controlling the number of tanks used) reaches three, the program restarts and your current game is over.

The program keeps track of both scores and high-scores, so if you do particularly well in a battle, you will be prompted for your name. Control of your tank is provided by the 6 and 7 keys (up and down) and the 0 fires the gun on your tank.

As always, when employing user-defined graphics, remember that they won't appear in the on-screen listing until you've tried to run the program once and the necessary characters have been redefined with the Spectrum's `REN` command.



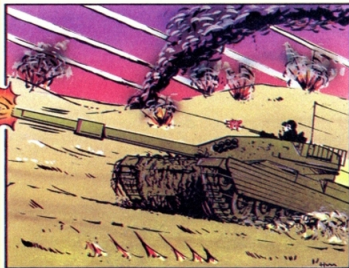
- 2 Set up flashing title screen.
- 3 Put a space in N\$ and gosub to subroutines for graphic definitions and instructions.
- 6-30 Set initial values for all the variables, define the type and speed of game.
- 35-60 Set up the starting screen with scores, high-scores and borders.
- 70-75 set up the sum numbers which randomize the value of variables a and b.
- 75-160 Create more sound effects and more screen detail.
- 170 Gosub to a routine for printing tank position then GOTO 520.

Title: *Mult*
Machine: *Sinclair Spectrum 16K/48K*
Language: *Spectrum Sinclair Basic*
Application: *Game*
Author: *Tommy Tate*

```

1 REM "mult"
2 FLASH 1: PRINT AT 4,7;"MULT
  by TOMMY TATE": FLASH 0
3 LET N$="" : GO SUB 3000: CL
S : GO SUB 4000
6 PAUSE 200
8 LET HISCORE=0: LET R=0: LET
T=0
9 INVERSE 1: LET J=0: PRINT A
T 17,3;"PRESS ANY KEY FOR NEW GA
ME": INVERSE 0: PAUSE 0
10 CLS : INPUT "INPUT + or *
";B$
11 INPUT "INPUT SPEED 1,2,3, 0
R 4 "":0: LET O=0/2
14 IF O>2 THEN GO TO 11
15 LET score=0
30 CLS
35 PRINT AT 19,2;"HI-Score = ";
HISCORE
40 LET x=30: LET i=0: PRINT AT
19,18;"Score = ";score
45 PRINT AT 20,6;"by": PRINT A
T 21,4;N$
50 PAPER 7: INK 1: BORDER 1
55 IF J=0 THEN PRINT AT 21,20:
" "
56 IF J=1 THEN PRINT AT 21,20:
" "

```



July 1984
75p

Personal Computer

GAMES

The magazine that names the top micro games



CBM 64

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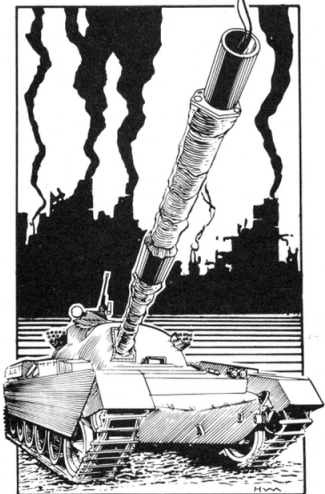
MULT

- 300 Print tank position.
- 500 Delete tank position.
- 510-540 Scan keyboard for user instructions and set up keys. u, up, down and fire.
- 545-550 Check tank position for overshoot.
- 570 Gosub print tank position.
- 590 Go to keyboard scanning routine.
- 610-650 Tank fire routine with sound effects and graphics.
- 660 Change ink
- 690 Check for miss and adjust score accordingly.
- 700 Check for hit.
- 705-775 Correct the hit routine and then move the number.
- 800 Applause special effect, using sound and border changes.
- 810 Adjust score.
- 815 pause.
- 820 GOTO 30 and start next question.
- 900 Aeroplane routine.
- 950-990 Bomb routine and check for (tank or bomb) hit.
- 1000 Give correct answer.

```

57 IF J=2 THEN PRINT AT 21,20;
"
"
60 INK 0: INVERSE 1: FOR f=2 T
0 12: PRINT AT f,17;" - - - -
": NEXT f: INVERSE 0: INK 1
70 LET a=2+INT (RND*11)
75 LET b=2+INT (RND*11)
80 FOR S=0 TO 116 STEP 2: PLOT
S,134: DRAW 0,12: BEEP .002,0:
NEXT S
85 BEEP .2,0: BEEP .2,14: PAUS
E 10
90 IF B#="+" THEN PRINT AT 4,2
;a;" ";B#;" ? = ";a+b
100 IF B#="*" THEN PRINT AT 4,2
;a;" ";B#;" ? = ";a*b
130 FOR y=2 TO 12
150 PRINT AT y,22;y
160 NEXT y
170 GO SUB 300: GO TO 520
300 INK 2: PRINT AT y,x;"": INK
0: RETURN
500 PRINT AT y,x;" ": RETURN
510 IF INKEY#="" THEN GO SUB 30
0: GO SUB 900: GO SUB 2000
520 IF INKEY#="7" THEN GO SUB 5.
00: LET y=y-1: GO SUB 300: LET i
=i+.5: GO SUB 900: GO SUB 2000
530 IF INKEY#="6" THEN GO SUB 5
00: LET y=y+1: GO SUB 300: LET i
=i+.5: GO SUB 900: GO SUB 2000
540 IF INKEY#="0" THEN GO TO 60
0
545 IF y=20 THEN LET y=19
550 IF y=0 THEN LET y=1
570 GO SUB 300
590 GO TO 510
610 FOR s=0 TO 11
620 PAPER 0: INK 2: PRINT AT y,
28-s;" "
630 BEEP .05,-16
640 INK 0: PRINT AT y,28-s;" "
645 PAPER 7
650 NEXT s
660 INK 1
690 IF b<>y THEN LET score=scor
e-5: BEEP .02,-16: PRINT AT 19,2
6;score;" ": GO TO 520
700 IF b=y THEN PRINT AT 16,12;
"RIGHT": LET u=-1: LET i=0: PAUS
E 25
705 IF y=4 THEN GO TO 770
710 FOR F=1 TO 10: PRINT AT y,1
6-F;y;" "
715 PAUSE 10
720 NEXT F
725 IF y=2 THEN LET R=-2
730 IF y=3 THEN LET R=-3
740 FOR N=0 TO y+R
745 PRINT AT y-N,6;y
750 IF y-N=4 THEN GO TO 770
755 PAUSE 10
760 PRINT AT y-N,6;" "

```



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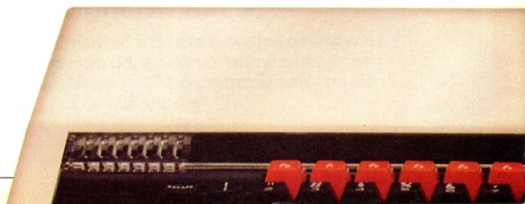
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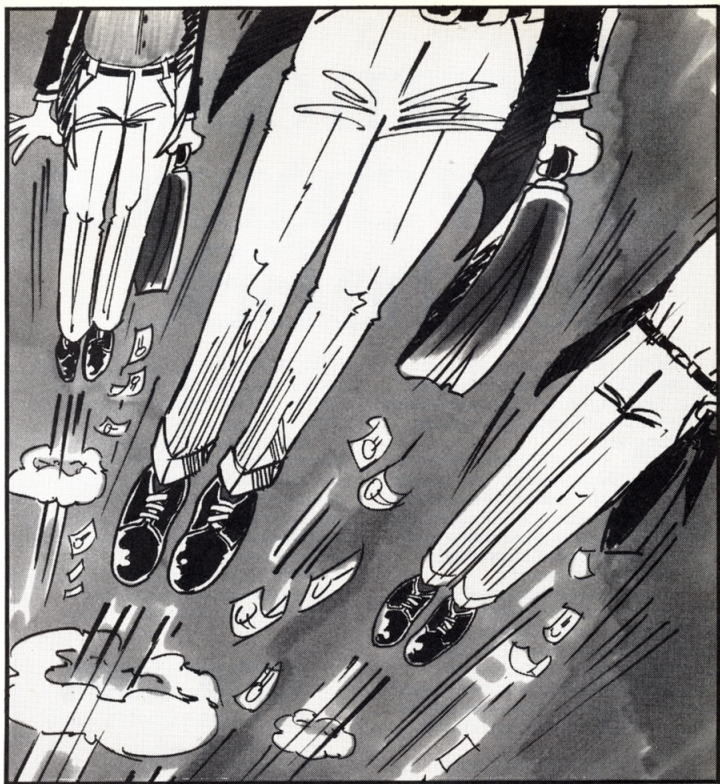
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MULT

```

▶ 50 1010    Check to see if score is a
             high score and get a new
             name if it is.
1020    Print name.
1030    Print high score.
1040    Check for the number of
             tanks used — if none left
             then goto the start of the
             game again.
1050    Give new question.
2015-2020  Set up variables for number
             movement routine.
2100-2200  Move number.
3002-3130  Set up graphics characters.
400-4060  Instructions

765 NEXT N
770 PRINT AT 4,6;y
775 PAUSE 40
800 FOR b=1 TO 7: BORDER b: BEE
P .01,b*2: BEEP .01,b: BORDER b-
1: NEXT b
810 LET score=score+10+(0*3)
815 PAUSE 25
820 GO TO 30
900 PRINT AT 0,i-1;" "
910 LET i=i+0
920 PRINT AT 0,i;" "
925 IF i>=29 THEN LET i=29: GO
TO 950
940 RETURN
950 FOR k=0 TO 20
960 INK 2: PRINT AT k,30;" "
962 INK 0
965 IF k=y THEN FOR m=0 TO 7: I
NK m: PRINT AT k,30;" ": BEEP .05
,-22: NEXT m: INK 0: LET J=J+1:
GO TO 1000
970 BEEP .05,k
980 PRINT AT k,30;" "
990 NEXT k
1000: PRINT AT 13,6;" BOMBED OUT
": PRINT : BEEP .2,-30: FLASH 1:
PRINT AT 15,8;"IT WAS ";b: BEEP
1,-38: BEEP .5,30: BEEP .4,20:
BEEP .3,10: BEEP .2,0: FLASH 0
1005 PAUSE 40
1010 IF J=3 AND score>HISCORE TH
EN INPUT "PRINT YOUR NAME";N$: L
ET HISCORE=score
1020 PRINT AT 20,6;"by": PRINT A
T 21,4;N$
1030 PRINT AT 19,2;"HI-SCORE=";
HISCORE
1040 IF J=3 THEN GO TO 9
1050 GO TO 30

```

```

2015 LET T=T+1: LET V=INT (RND*8
)
2020 LET H=17
2100 INVERSE 1: PRINT AT T,H;" -
- - - ": BEEP .002,0: LET L
=INT (RND*6): INK L: PRINT AT T,
H+V;T
2105 INVERSE 0
2110 IF T=12 THEN LET T=1
2200 RETURN
3002 LET b=BIN 00000011: LET c=B
IN 00111111: LET d=BIN 11111111:
LET e=BIN 11000000: LET f=01111
111
3010 FOR n=1 TO 8: READ p$
3020 FOR f=0 TO 7
3030 READ a: POKE USR p$+f,a
3040 NEXT f
3050 NEXT n
3055 LET K=0: RETURN
3060 DATA "a",b,c,c,b,f,d,d,d
3070 DATA "b",e,e,e,e,d,d,d,d
3080 DATA "c",BIN 0,BIN 0,f,d,d,
f,BIN 0,BIN 0
3090 DATA "d",BIN 0,BIN 01100000
,BIN 01110010,BIN 011110011,d,d,
BIN 00001111,BIN 00011100
3100 DATA "e",BIN 0,BIN 0,BIN 0,
BIN 11001110,d,d,BIN 11000000,BI
N 10000000
3110 DATA "f",BIN 0,e,BIN 011111
00,d,d,BIN 01111100,e,BIN 0
3120 DATA "g",BIN 01010100,BIN 0
1000100,BIN 10000101,BIN 0001011
1,BIN 01011010,BIN 01011010,BIN
01110101,BIN 11110101
3130 DATA "h",BIN 10100100,BIN 1
0100100,BIN 10100101,BIN 1111010
1,BIN 11110111,BIN 10011010,BIN
01010010,BIN 01010101
4000 CLS : PRINT : PRINT "TRY AN
D GET THE HIGHEST SCORE BYHITTIN
G THE CORRECT NUMBER"
4010 PRINT : PRINT "IF YOU SHOUL
D HIT THE WRONG ONE YOU WILL LOS
E 5 POINTS"
4020 PRINT : PRINT "A CORRECT HI
T WILL GAIN YOU A SCORE ACORDI
NG TO YOUR SPEED"
4030 PRINT : PRINT "YOU HAVE 3 T
ANKS TO DO THIS WITH"
4040 PRINT : PRINT "IF YOU FAIL
TO HIT THE CORRECT NUMBER BEFOR
E THE PLANE REACHES THE TOP RIGH
T OF THE SCREEN THENIT WILL DROP
A BOMB ON YOU "
4050 INK 2: PRINT " PRESS 6 FOR
DOWN": PRINT : PRINT " PRESS 7
FOR UP": PRINT : PRINT " PRESS
0 TO FIRE": INK 0
4060 RETURN

```

A Penny For Your Thoughts

Actually MicroQuest offers you rather more than a penny.

£1,000 to be precise, if you can come up with an idea for an innovative and original use of microelectronics.

MicroQuest is organised jointly by Williams & Glyn's Bank and MAP, the Department of Trade and Industry's programme to encourage the application of microelectronics. The competition aims to encourage young people to take an active part in the development of British industry and business.

WHO CAN ENTER?

MicroQuest is open to everyone between the ages of 16 and 21, and is divided into two categories. The first is a general category allowing entries from anyone between 16 and 21, and the second dealing with those over 16 in secondary education.

We require entrants to MicroQuest, to submit a 2,500 word report, identifying a new use for microelectronics and explaining how it could be implemented.

The applications can be literally for anything from musical instruments to control systems for mining machinery. The idea of the competition is to produce applications that will improve and develop original products or processes. It is important, however, that you keep in mind that the applications must be practical and

therefore realistic in terms of cost.

The report itself should give us a clear description of the area where you see the application being made, and what will be the benefits of the application. If you wish to illustrate your report, make sure that all your designs/illustrations are on A4 paper and that there are no more than 6 of them. When you send in your report it should include a summary of about 300 words of its contents.

The prizes for the general category will be a first prize of £1,000, with runners-up receiving prizes of £500 and £250. The schools category will have a first prize for the winner's school of £500 of computer equipment of its own choice, plus a cash prize of £150 for the winner. The runners-up will receive £100 and £50.

HOW TO ENTER

Simply tear off and complete the attached entry form and submit it with your report, which should also include a 300 word summary and any designs you have produced. The completed application form should be signed by your employer, teacher or supervisor.

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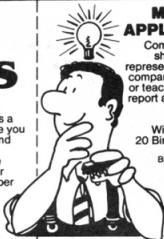
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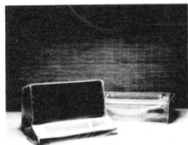
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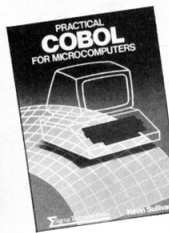
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Need some help? Or just looking for a little computer-related reading? Let us advise you.



'Practical Cobol for Microcomputers' by Kevin Sullivan, published by Sigma Technical Press at £6.95 (paperback, 198 pages) and **'Cobol for Micros'** by Norman Stang, published by Newnes Technical Books at £7.95 (paperback, 193 pages).

A few weeks ago Cobol celebrated its 25th birthday and the committee that has guided its development looked forward to 25 more years, during which it will become widely used on micros, the committee members predict.

These two books demonstrate the tide is already turning that way. They also take different starting points, reflecting the likelihood that micro owners who take to Cobol will be split between new users and members of existing data processing departments.

Kevin Sullivan presents his book as a 'first read' for anybody wanting to look the language over before committing themselves, while Norman Stang aims particularly at Cobol programmers from mainframe environments.

Hence Mr Sullivan illustrates his text with programs developed and tested on a Tandy Model III with Ryan-McFarland's RMCobol, and the micro environment is taken for granted. Mr Stang devotes an early chapter to the micro system, using CP/M as a typical operating system.

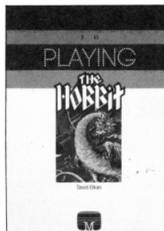
The structures of the books also differ; a Cobol program runs from Identification Division to Stop with the undeviating monotony of a sacred ritual but books about Cobol apparently offer more scope. But the subject matter is the same and it's treated in the same

fashion. Mr Sullivan's book, thanks to the typeface, looks livelier but this is a superficial distinction. Perhaps when you're trying to explain a Cobol Data Division there is only one way of going about it.

Mr Sullivan's book is better endowed with appendices and the text is generally easier on the eye. Mr Stang's scores on sample programs. Both go to some trouble to explain why Cobol should find a niche at the micro end of the business — which of them you prefer will probably depend on your own familiarity with computing.

One final proviso — you should take with a pinch of salt Mr Sullivan's assertion that his book can be used without a machine to practice on. Joseph Cooper's performances at the dummy keyboard are very impressive but he'd surely use a real piano if there was one handy.

DG



'A guide to playing the Hobbit' by David Elkan, published by Melbourne House at £3.95 (paperback, 76 pages).

Having dealt in detail with the film of the book, computer

adventures have now begun treading the territory of the book of the film. This book, inspired by JRR Tolkien's myths, is the answer to every frustrated Hobbit fancier's dream, and will also be useful to help out the odd computer journalist struggling under the weight of unintelligible adventure queries.

Whichever way you look at it, you have to take your hat off to Melbourne House. First the company designs a game complex enough to leave most people stuck at some point inside it, then Melbourne produces a book telling them how to get out of the holes they're stuck in. Naturally, this raises the purist's hackles. After all, what exactly is the point in buying an adventure that'll give you weeks of amusement if you're then going to buy something else that will allow you to solve it in a matter of hours? It's a nice way to make money, but is it ethical?

That said, there is a market for a book of this sort, although ethical considerations would make me feel that it would be better to invest in a guide to playing adventures in general, rather than just a guide to one game. I feel this would smack less of cheating.

By paperback standards the book is also quite expensive. The mere £3.95 may seem cheap for a computer book, but if you think in terms of what you'd pay for a major work of literature (such as War and Peace), it's diabolical. On top of this, the bulk of part three of the book, *A Tourist's Guide to Wilderland*, is taken up by blank space.

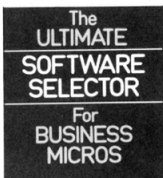
Still, if you need help, you'll probably find you can afford it. But take it from me, you can hang in there, do the Hobbit the honest way, and fight the urge to buy this book.

JL

'The Ultimate Software Selector for Business Micros' compiled by The Federation of Microsystems Centres. Published by Macmillan Press at £9.95 (paperback, 126 pages).

Would you pay £10 for a paper copy of someone's database? That's essentially what you get in this rather cheaply-presented A4 paperback.

Seven of the 11 chapters



detail between 15 and 60 programs. The applications include databases, production/inventory control, payroll, financial modelling, accounting systems and so on. Each begins with a brief introduction, a glossary of terms used for the column entries or the range of the programs listed. Following this, there's a table of software.

Program titles are in alphabetical order, grouped in fives, which makes the table easy to access quickly. For each program there are up to 30 column entries; these are dedicated to the type of package in the section. This is the nicest touch. For example, under word processing column heading include centre text, underline/bold and displayed as printed. This is so much more informative than rating all programs on scales like 'user friendliness'.

The first few chapters go into how to judge software and good advice is given about checking out post-sale software support. Chapter ten gives useful addresses and the last chapter details a host of software distributors.

There are some niggles. Three chapters don't explain column headings, so it can be difficult to compare products.

Only seven pages are allocated to dedicated vertical marketing packages, yet there is a great demand for such programs.

I'll be using this book, but can't help wondering why it's so highly priced. A year's subscription to 'Software File' is five times the cost of the book, but the magazine's updated every two months. The magazine may not provide potted reviews, but contains many more programs.

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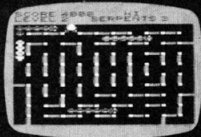
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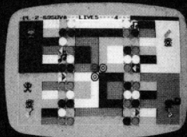
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
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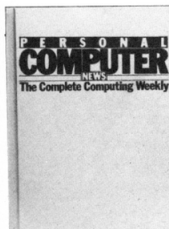
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A legitimate question

Hardly anybody worries much about legitimacy these days. But the forelock-tugging sycophants of the computer industry worry about it — their own legitimacy, that is. And to what do they bow and scrape, these shameless lickspittles? To IBM.

When IBM years ago produced a box that was slightly smaller than its mainframe boxes people declared that IBM had legitimised the mini-computer; Data General won respect and notoriety with its response: 'The bastards say welcome.' When IBM pro-

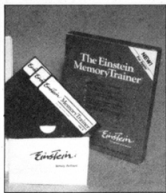
duced the pseudo-16-bit pseudo-state-of-the-art PC, people wept openly with gratitude: IBM had legitimised the microcomputer, they cried. Now IBM has produced the portable PC, and the US branch of the International Invertebrates Association has already started to promote the idea that IBM has legitimised portability.

But if any of these people recognise themselves and take umbrage, you can bet they won't reply with a libel writ. IBM has never sued PCN, so it just isn't a legitimate option.

NEXT WEEK

Amstradivarius — Will the hi-fi maker's micro hit the high notes? Find out in PCN's Pro-Test.
Plugging away — Compatibility is how many micro builders mimic IBM... but they aren't all up to Mike Yarwood standard.
Mastermind — We keep score with a

quiz package for the BBC micro.
Hi-Fidelity — From the TV star Fidelity comes a low cost colour monitor. We tell you what sort of reception you can expect.
Gameplay — Reviews of new games for the Spectrum and the Vic 20.
Programs — Atari and BBC systems are the object of this week's source code.



Relatively memorable

Remember the Tatung Einstein, star of many a news report and syntax error? You don't? Then you need the Einstein Memory Trainer, a snip from Pete and Pam at £59.95. 'Simply brilliant,' says its designer, the Los Angeles-based Einstein corporation. What higher recommendation could there be?

Type mismatch

The proof readers evidently took their eyes off the ball when compiling the introductory manual to the Tandy 2000. Take the contents page: Chapter 11 — In case of trouble Chapter 12 — And that's just the beginning.

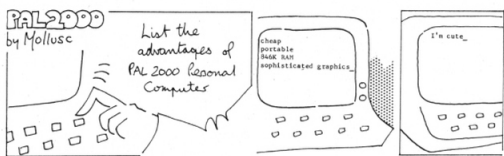
A word from the wise...

At PCN we're used to receiving documentation that is shoddily produced, or lacking in some important detail, or just downright inadequate for the task in hand.

It is always a pleasure to receive a piece of documentation that truly has the user's interests at heart, right down to the small details. We're talking about the installation manual for the Olivetti M24. As an example, it says: "Before installing your system you should wait until your entire order has arrived".

Sound advice since one piece of vital equipment arrived much later than the bulk of PCN's M24.

Unfortunately, but perhaps inevitably, it was the installation manual...



PCN DATELINES

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IBM User Show	June 12-14	Wembley Complex	Online Conferences 01-868 4466
Computer Fair	June 14-17	Earls Court	Reed Exhibitions 01-643 8040
Compec North	June 19-21	Belle Vue, Manchester	Reed Exhibitions 01-643 8040
National Conference and Exhibition on Computers in Personnel	June 26-28	Royal Lancaster Hotel, London	Peter Mirrington Exhibitions (0277) 232030
Networks 84	July 3-5	Wembley Complex	Online Conferences 01-868 4466
PC User Show	July 3-5	Novotel Hotel, London W6	Daniel Evans 01-837 3699 ext 244
Microtrade '84	July 4-6	Barbican, London	Montbuild Ltd 01-486 1951
Electron & BBC Micro User Show	July 19-22	Alexandra Palace, London	Database Publications, 061-456 8383

OVERSEAS EVENTS

Event	Dates	Venue	Organisers
International Computer Show for Office, Home, Hobby	June 14-17	Cologne, Germany	German Chamber of Industry and Commerce 01-930 7251
National Computer Conference and Exhibition	July 9-12	Las Vegas, USA	American Federation of Information Processing Societies Inc. 0101 703 620 8900

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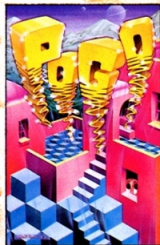
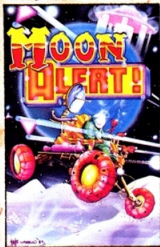
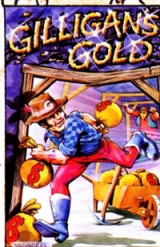
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